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Artemis Alexiadou, Monika Rathert (Eds.)

THE SYNTAX OF NOMINALIZATIONS ACROSS LANGUAGES AND FRAMEWORKS

INTERFACE EXPLORATIONS



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The Syntax of Nominalizations across Languages and Frameworks

Interface Explorations 23

Editors

Artemis Alexiadou
T. Alan Hall

De Gruyter Mouton

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edited by

Artemis Alexiadou
Monika Rathert

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Preface

The chapters in this volume grew out of papers presented at the workshop "Nominalizations across Languages" that we organized at Stuttgart University, Germany, in December 2007. It was a lively and engaging workshop, with many good papers – in fact too many for a single volume. We decided to split the papers in two volumes, one focusing on the syntax of nominalizations (the current volume, IE 23), the other one focusing on the semantics of nominalizations (IE 22). The split reflects nicely the kinds of contributions we received, although we want to stress that there are, of course, many overlapping and unifying questions.

The current volume IE 23 explores the syntax of nominalizations, focusing on deverbal and deadjectival nominalizations, but also discussing the syntax of genitives and the syntax of distinct readings of nominalizations. The volume investigates the morphology-syntax interface as well as the semantics-syntax interface in the domain of nominalizations. The theoretical frameworks include distributed morphology, and minimalist syntax. Data from a variety of languages are taken into consideration, e.g. Hebrew, Bulgarian, Serbian, French, Spanish, German and English.

It was an enormous pleasure for both of us to prepare the volumes. We would like to thank our authors for their contributions, we have benefited enormously from reading their chapters. Many thanks also to our reviewers for their insightful and inspiring comments.

Many thanks also to the DFG for the financial support that made this event possible.

Finally, we would like to thank Anke Beck, Julie Miess and Ursula Kleinhenz at Mouton de Gruyter for their valuable editorial assistance and guidance. Thanks also to Frank Benno Junghanns for proofreading and taking care of the formatting of the manuscripts.

Artemis Alexiadou and Monika Rathert
Stuttgart/Wuppertal, May 2010

Contents

Preface v
Contributors ix

Introduction 1
Artemis Alexiadou and Monika Rathert

On the syntax of episodic vs. dispositional *-er* nominals 9
Artemis Alexiadou and Florian Schäfer

On the morphological make-up of nominalizations in Serbian 39
Monika Bašić

A syntactic account of affix rivalry in Spanish nominalizations 67
Antonio Fábregas

The syntax of deverbal nominals in Bulgarian 93
Angelina Markova

Deadjectival nominalizations and the structure of the adjective 129
Isabelle Roy

Event-structure constraints on nominalization 159
Ivy Sichel

Aspect and argument structure of deverbal nominalizations:
A split *v*P analysis 199
Petra Sleeman and Ana Maria Brito

Post-nominal genitives and prepositional phrases in German:
A uniform analysis 219
Torgrim Solstad

Author index 253
Subject index 256

Contributors

Artemis Alexiadou is Professor of Theoretical and English Linguistics at the Universität Stuttgart. Her research interests lie in theoretical and comparative syntax, with special focus on the interfaces between syntax and morphology and syntax and the lexicon. She is currently working on nominal structure and verbal alternations. She has published work in *Linguistic Inquiry*, *Natural Language and Linguistic Theory*, and *Studia Linguistica* among others.

Monika Bašić is a PhD student at the Center for Advanced Study in Theoretical Linguistics (CASTL), University of Tromsø. She is interested in various aspects of syntactic theory, particularly in constraints on syntactic movement operations. She has published and presented work on topics including left branch extractions, the structure of prepositional phrases, verbal morphology in Slavic, and nominalizations. Her main focus is on Slavic language family.

Ana Maria Brito is a Full Professor at the Faculdade de Letras da Universidade do Porto, Portugal. PhD in Portuguese Linguistics in 1988, with a dissertation on the syntax of relative clauses. She is one of the authors of the *Gramática da Língua Portuguesa* (Caminho, Lisboa, 2003), and author of circa 60 papers on different aspects of Portuguese syntax in a comparative perspective, mainly on nominal phrases, possessives, deverbal nominalizations, relative clauses, canonical comparatives.

Antonio Fábregas is Associate Professor of Spanish Linguistics at the Institutt for Språkvitenskap of the University of Tromsø. His research has focused in the analysis of morphology and morphological processes from a syntactic perspective, as well as in semantics and pragmatics. He has collaborated in the *New Grammar of Spanish* (2009) from the Spanish Royal Academy of Language and has published papers on relational adjectives, degree achievements, exocentric compounds and prefixation, among other topics.

Angelina Markova is a PhD student at the Universitat Autònoma de Barcelona, a member of the Center for Theoretical Linguistics there (Centre de Lingüística Teòrica) and a non-official affiliated researcher for the European

Cooperation in Science and Technology (COST) within COST Action A33 ('Crosslinguistically Robust Stages of Children's Linguistic Performance'). She is interested in comparative nominal syntax between Slavic (e.g. Bulgarian), Romance (e.g. Spanish and Catalan) and Germanic (e.g. English) together with the linearization of verbal and nominal affixes in Slavic. More precisely, she has centered her investigation in the hierarchy of functional projections dominating the noun head and the contribution of the verbal prefixes within a nominal. Her PhD dissertation is entitled 'The role of prefixation in the nominalizing process' and is currently under revision.

Isabelle Roy recently completed a post doc at the Center for Advanced Study in Theoretical Linguistics, Tromsø, Norway and is now an Assistant Professor in Theoretical Linguistics at the UMR 7023 'Structures Formelles du Langage', Université de Paris 8 – Saint Denis. Her research interests lie in theoretical and comparative approaches to the syntax-semantics and the syntax-lexicon interfaces with a particular interest in predication, complex predicates, stativity and nominalizations.

Monika Rathert is Professor of German Linguistics and Director of the Center for Linguistics at Bergische Universität Wuppertal. Her research interests lie in morphosyntax, semantics, and the language of the law. Her books include *Textures of Time* (Akademie, 2004), and *Sprache und Recht* (Winter, 2006); she has edited *Perfect Explorations* (Mouton, 2003) together with Artemis Alexiadou and Arnim von Stechow, *Formal Linguistics and Law* (Mouton, 2009) together with Günther Grewendorf, and *Quantification, Definiteness, and Nominalization* (Oxford, 2009) together with Anastasia Giannakidou.

Florian Schäfer's research interests lie in theoretical and comparative syntax, especially in the interfaces between syntax, semantics, morphology and the lexicon. He received a Diploma in Theoretical Linguistics from the University of Potsdam and a PhD in Linguistics from the University of Stuttgart. Since 2007 he has been working as a post-doctoral researcher at the University of Stuttgart on a project on nominalizations. He has published papers in *Language* and *Linguistics Compass*, the proceedings of *NELS* and *WCCFL* and several edited collections.

Ivy Sichel is assistant professor in Linguistics and Cognitive Science at The Hebrew University of Jerusalem. Her research interests include nominalization and the structure of DP, the syntax and semantics of possession, and the

syntax and semantics of pronouns and agreement. She has published her work in *Natural Language and Linguistic Theory* and in *Linguistic Inquiry*, among others.

Petra Sleeman is working in the department of Romance linguistics of the University of Amsterdam. She was a guest lecturer at the University Paris VII, the University Paris III, and an invited professor at the University Lille 3. She graduated in 1996 with a thesis on nominal ellipsis titled Licensing Empty Nouns in French, which was supervised by Aafke Hulk and Denis Delfitto. Petra Sleeman's main research topic is the French DP: the position of adjectives, adjectival agreement, noun ellipsis, relative clauses, the partitive construction, definiteness, deverbal nominalization and deverbal adjectivalization, and dislocation and focalization of DPs. Furthermore, she has done research on the acquisition of dislocation, definiteness, and clitic placement in L2 French.

Torgrim Solstad (PhD, University of Oslo) is a researcher in Theoretical and German Linguistics at the University of Stuttgart. Currently, he is employed in two projects dealing with verbs and their nominalizations on the one hand and foundational aspects of ambiguity and disambiguation on the other. Focussing on underspecification and the syntax-semantics interface, he is particularly interested in lexical semantics, argument realization, word formation and adverbial syntax and semantics.

Introduction

Artemis Alexiadou and Monika Rathert

Nominalizations have been central in linguistic research, as they constitute an instance of structures showing categorially ambivalent behavior. The most comprehensive work on English nominalizations to date is certainly Grimshaw (1990) who argues that deverbal nouns do not form a homogeneous class. As (1) illustrates, nouns such as *examination* are ambiguous between an event reading that supports argument structure (AS), and a non-event reading that does not. (1b) is taken to instantiate the referential use of the nominal, while (1a) instantiates the AS use.

(1) a. the examination of the patients took a long time
b. the examination was on the table

Nominals formed via *-ation* are not the only ambiguous ones in English. Nominals formed via *-er* (e.g. *destroyer*) are ambiguous between an agentive reading on which they license AS (*the destroyer of the city*) and an instrumental one on which they do not (*destroyer = warship*). Similar observations hold for *-ing* nominals (e.g. *this is a good reading* and *John's reading the poem surprised us*. Table 1 summarizes the criteria Grimshaw introduced to distinguish between the two types of nominals in English:

Table 1.

Referential Nominals (RNs)	Argument structure (AS)-Nominals
non-θ-assigner, no obligatory arguments	θ-assigners, obligatory arguments
no event reading	event reading
no agent-oriented modifiers	agent-oriented modifiers
subjects are possessives	subjects are arguments
by phrases are non-arguments	*by* phrases are arguments
no implicit argument control	implicit argument control
no aspectual modifiers	aspectual modifiers.
modifiers like *frequent, constant* only with plural	modifiers like *frequent, constant* appear with singular
may be plural	must be singular

In the research on nominalization, we can recognize two main models which attribute the AS in the nominal domain to two different aspects of representation: the lexicalist model and the structural model. Representatives of the former model, e.g. Grishmaw and certainly many others, claim that the noun inherits the AS from the embedded verb, and this type of transformation happens in the lexicon. Specifically, in order to explain the ambiguity in (1), Grimshaw claims that this is only possible in the presence of an event argument in the lexical representation of the noun.

On the other hand, the structural model holds that the presence of AS follows from the presence of a VP node (or perhaps some functional projection of VP) inside the nominal structure, see e.g. (Alexiadou 2001), (Borer, to appear) and others. The main idea behind the structural model could be described as follows: it is the syntactic structure that gives rise to an event template which in turn determines the interpretation of arguments. In other words, the event interpretation arises through the presence of verbal functional layers in the nominal structure and is not part of the lexical entry. All our contributions here adopt variants of the structural model.

Importantly, both the lexical and the syntactic model converge in the idea that AS nominals are those nominals that inherit the AS of the verb embedded within them. This suggests a very concrete relationship between morphology and meaning. Only nominals that have been verbs as part of their derivational history can license AS.

Work within the framework of Distributed Morphology, but also Borer (to appear), following crucially (Abney 1987), suggests that nominalizers can embed structures of variable size. When the affix embeds just a root, i.e. when it attaches low, lack of AS and of eventive readings follow, since nothing is there to license AS. When the affix embeds a more complex structure which contains a number of functional projections bringing about an eventive interpretation, then AS is licensed. In other words, the difference in the height of attachment of the affix gives the different readings (event vs. result). High attachment signals an event reading and the licensing of AS, while low attachment signals a result reading and the absence of AS.

Still, however, derived nominals seem to be somehow deficient in comparison to their verbal counterparts. This 'deficiency' relates to the non-obligatoriness of the presence of AS within nominals. A more recent concern is that even if the nominal lacks an event interpretation, its morphological decomposition suggests that it contains verbal layers (Alexiadou 2009, Harley 2009). This suggests that the layers responsible for the licensing of AS have to be dissociated from the layers that simply verbalize a structure.

In addition to the licensing of AS, an important aspect that several researchers have been investigating is affix rivalry, i.e. the competition between two or more affixes and the properties they are sensitive to. For instance, in English, nominal *-ing* attaches to all sorts of root types, i.e. manner, result, but also statives (*smearing vs. opening vs. knowing*). On the other hand, the suffix *-ation* is rather particular in terms of transitivity. Smith (1972) discusses English verbs displaying a causative/inchoative alternation that nominalize without (overt) affixation. Smith points out that these verbs never nominalize as "transitive" nouns, but only as nouns with a possessive alone, see also (Chomsky 1970). Examples include *change*, *end* and *stop*, which form nominals, but not transitive ones. The generalization is visible in these contrasts: *the climate's change/*global warming's change of the climate*; *the race's end/*the judge's end of the race*; *the train's unscheduled stop/* the guard's unscheduled stop of the train*. Smith argues that the ability to derive "transitive" causative nominalizations from "intransitive" causative verbs is limited to affixes drawn from the Latin vocabulary and is not observed in the Anglo-Saxon vocabulary of English. Thus *alteration* contrasts with *change*, *termination* with *stop*, and *conclusion* with *end.*

The papers in this volume address all of the above issues and introduce further and finer distinctions in nominalizations. Let us briefly summarize their main contributions.

Alexiadou and Schäfer are concerned with the semantic and morphosyntactic properties of *-er* nominalizations in English. They argue that one should distinguish between two groups of *-er* nominals: those that obey the external argument generalization, irrespectively of whether they are eventive or not, and whether they have complements or not, and those that do not obey the external argument generalization. The first group *-er* nominals sub-divides into episodic ones, which always project their internal complements, and dispositional ones, which may leave these objects unexpressed. The authors argue that both episodic and dispositional nominals have the exact same rich syntactic structure, namely they are derived from verb phrases. They differ as far as their aspectual properties are concerned, a property from which they derive from the presence vs. absence of complement structure. The second group contains *-er* nominals that are not fully productive and thus has a poorer syntactic internal structure. Specifically, these involve affix attachment at the root level and not contain any verbal layers.

Bašić investigates the morpho-syntactic properties of nominalizations in Serbian. Taking as a starting point the observation that the presence of ver-

bal morphology is evidence that verbal projections are present, then considering that RNs can contain the same morphological markers, one has to conclude that these functional projections occur inside RNs as well (see above). Thus, while their semantic and syntactic properties suggest that AS nominals and RNs have different structural representations, morphological evidence seems to suggest the opposite. She argues that (i) RNs (may) contain 'verbal' functional layers, (ii) RNs do not however contain eventive little *v* and (iii) the differences between AS nominals and RNs can be made to follow from distinct structural representations, despite morphological identity between the two types.

Fábregas is concerned with the problem that apparently equivalent affixes in e.g. Spanish compete to derive words of a certain class, in such a way that, seemingly, different bases require different affixes. He pursues a syntactic approach not only to word formation, but also to affix rivalry, and he shows evidence that the choice between the three productive nominalizer suffixes is not idiosyncratic or motivated by general principles of parsing, but is due to the syntactic and (structural) semantic properties of the base. His approach makes clear predictions with respect to the properties of the event nominalizations constructed with different affixes. In particular, structural properties of the verb, and their semantic reflects, determine the distribution of an affix. Thus, if a verb allows more than one construction, we expect this verb to have more than one event nominalization with specific syntactic-semantic properties. As a result, the event nominalizations will have different syntactic and semantic properties depending on the affix used.

Markova provides a syntactic analysis of deverbal nominals in Bulgarian. Her starting point is the assumption that word formation is syntactic and functional and that a categoriless root is spelled out as a noun, adjective, or verb, depending on the functional layers that dominate it (Alexiadou 2001). However, she shows that sometimes a stem and not a root must be inserted in syntax. A crucial factor for the derivation of nominals is the status of nominalizers within the nominalizing process. Markova claims that in Bulgarian they can appear in the form of gender suffixes or various derivational suffixes marked for gender. Thus, the proposal is that noun formation results from the merger of a nominalizing head n° with an XP where XP can be a categoriless root (√P) or a verbal stem (VP), AspP, or VoiceP. It is also shown that nouns differ depending on the functional layers they contain and on the feature specification of these layers, as suggested in Alexiadou (2001).

Roy's paper is concerned with a rather neglected area in the research on nominalizations, namely de-adjectival nominalizations in French. She shows that the formation of deadjectival nominals is constrained in a very system-

atic way by the (semantic) type of the 'base' adjective, restricting them to intersective adjectives only; i.e., descriptively, to those found also in predicative positions. This generalization finds a simple explanation if one assumes a dual source for the adjective. Adjectives that can be used predicatively (henceforth, predicative adjectives) are generated in a predicative structure (PredP), even when they appear as N-modifiers; whereas adjectives that can never be used predicatively (henceforth, attributive adjectives) are generated in a simple AP. Assuming a syntactic view on word formation, the nominalizing suffixes are the realization of a predicative head in the nominal domain, reducing, thereby, the class of adjectives that can form the base of a nominalization to the ones that are generated in a predicative structure. As mentioned above, it has been claimed for deverbal nominals that the realization of nominal arguments correlates with an event reading, and in recent syntactic accounts, both are related to the presence of an underlying verbal structure. Roy points out that if the formation of nominals from adjectives is in any way comparable, and if all deadjectival nominals must have a predicative base, one would expect all deadjectival nominals not only to have arguments but also to have an eventuality reading. However, Roy shows that deadjectival nominals belong to two classes with distinct properties; in particular one which does support argument structure and an eventuality interpretation and another one which, prima facie, does not.

Sichel's contribution provides a preliminary delineation of the particular sense or senses in which nominalization and derived nominals are deficient. She argues that in addition to pure morpho-syntactic deficiency, derived nominals in English are also deficient in the sort of events they can host and are restricted to simple, single events. They contrast, in this respect, with ING-OF nominalizations, which are similarly deficient in their range of purely morpho-syntactic projections, but are not constrained in terms of the kinds of events they can host. A glimpse of the difference can be seen in that while both derived nominals and ING-OF gerunds exclude particle-shift, the particle is possible without shifting in ING-OF gerunds but not in derived nominals. Taking particles to add an end-point or result component to an activity, this suggests that ING-OF gerunds may denote complex events while derived nominals may not. Particle shift, from this perspective, would require additional morpho-syntactic structure. A further point is the agent exclusivity in English and Hebrew nominalizations. Sichel defines the relevant notion of agency in temporal terms leading to event-identification and the restriction to single, simple events. She then suggests that restrictions on nominal passive in English are understood as just another case of event simplicity in derived nominals.

Sleeman and Brito build on earlier work where they argued that more than two readings can be distinguished for nominalizations. They distinguish five readings, which are connected not only to different aspectual readings, but also to the expression of argument structure. As is the case with other contributions to the volume e.g. Bašić and Fábregas, Sleeman and Brito propose, following Ramchand (2008), that the *v*P can be split up in various functional projections: Initiator Phrase, Process Phrase and Result Phrase. In the specific case of nominalizations, they argue that the split *v*P hypothesis can account for the five readings distinguished in their earlier work.

Solstad investigates the ambiguity associated with the genitive DP within nominalizations. As is well knonw, adnominal genitives and prepositional phrases (PPs) have a wide range of interpretations. For instance, they may be interpreted as arguments of an event nominalization or a relational noun. They may also express possession or some general associative relation. In a number of analyses, the difference between the interpretation of a genitive as corresponding to a theme or agent argument of a verb underlying a deverbal nominalization on the one hand, and the interpretation of a genitive as a possessor is assumed to have a syntactic correspondence. Thus, for instance, for genitive theme arguments, a syntactic position parallel to that of the direct object of verbal projections is assumed (correspondingly, a separate position may be assumed for agent arguments). For possessives or other associative genitives, however, a different position is assumed, possibly as a sister of a nominal head or adjoined to the noun phrase. Solstad argues that in German, post-nominal genitives should all be analyzed uniformly syntactically as well as semantically. The main claims of his approach may be summarized as follows: all post-nominal genitives and PPs are adjoined to NPs, assuming DP to be the highest functional projection dominating a noun phrase. All post-nominal genitives are represented semantically by the underspecified two-place relation ρ(rho). Being underspecified, this relation may be instantiated differently, which is what gives us the different interpretations of post-nominal genitives. For PPs the semantic picture is somewhat more diverse, but still compatible with this assumption.

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On the syntax of episodic vs. dispositional *-er* nominals

Artemis Alexiadou and Florian Schäfer

1. Introduction

In this paper, we are concerned with the semantic and morphosyntactic properties of *-er* nominalizations in English. Our main contribution to the theoretical discussion on these nominals is that we should distinguish between two groups of *-er* nominals: those that obey the external argument generalization, irrespectively of whether they are eventive or not, and whether they have complements or not, and those that do not obey the external argument generalization. The first group of *-er* nominals sub-divides into episodic ones, which always project their internal complements, and dispositional ones, which may leave these objects unexpressed; we argue that both episodic and dispositional nominals have the exact same rich syntactic structure, namely they are derived from verb phrases. They differ as far as their aspectual properties are concerned, a property from which we will derive the presence vs. absences of complement structure. The second group contains *-er* nominals that are not fully productive; we argue that these have a poorer syntactic internal structure. Specifically, these involve affix attachment at the root level and do not contain any verbal layers.

The paper is structured as follows. In section 2, we offer a brief overview of the literature on the subject and outline our analysis as well as our theoretical assumptions. In section 3, we propose our decomposition of *-er* nominals. In Section 4, we discuss the episodic vs. dispositional distinction for *-er* nominals that obey the external argument generalization. In section 5, we turn to those *-er* nominals that do not obey this generalization. In section 6, we offer some brief conclusions.

2. Background

2.1. Types of *-er* nominals

Previous approaches to English *-er* nominals held that these can be divided into two major subclasses (see Rappaport Hovav and Levin 1992, Fabb 1984, Keyser and Roeper 1984, van Hout and Roeper 1998 to mention a few), the

relevant semantic property being whether they refer to an actual event or not. That is, *-er* nominals vary with respect to the [±event] specification.

Several sub-classes of these major categories have been discussed. First, it was pointed out that [+event] *-er* nominals are not necessarily agentive; more concretely, they simply correspond to the external argument of the base verb irrespective of the thematic role that this verb assigns to its external argument (agent, causer, holder, experiencer, instrument; the 'external argument generalization'). Some examples (from Rappaport Hovav and Levin 1992) are given below:

(1) a. … is a great **defuser** of pent-up emotions (causer)
b. … a **holder** of a Visa or Master cart (holder)
c. …as a dazzled **admirer** of Washington (experiencer)
d. A protein that is a potent **inducer** of new blood vessel growth (instrument)

[–event] *-er* nominals also fall into two thematic groups. In the first group we find [+agentive] nouns, as in (2); in the second group, we find [+instrumental] *-er* nominals, as in (3). Both classes have in common that they denote entities which are *designated* for some specific job or function but which do not actually have to be involved in such a job or function (the [–event] property).

(2) lifesaver, fire-fighter, teacher → a person educated for a specific job

(3) a. a grinder → machine intended for grinding things
b. the destroyer → something intended for the purposes of destroying, warship

The [±event] division has been argued to correlate with the availability of complement structure (CS). This is stated clearly in Rappaport Hovav and Levin (1992). The term CS here is understood as involving the projection of full DPs, which, as argued in detail by Longobardi (1994), can receive thematic roles and appear in argument positions:

> **Correlation A:** An *-er* nominal has a complement structure iff it has an eventive interpretation [+event].

The examples in (4) and (5) illustrate this. In (4a) and (5a), the presence of the internal argument leads necessarily to an interpretation according to which the referent of the *-er* nominal must have been involved in a saving event or a murdering event.

(4) a. a saver of lives → *can only refer to a person that has saved a life*
b. lifesaver → *has not necessarily saved lives*

(5) a. the murderer of the president → *Lee Harvey Oswald*
b. the presidential murderer → *not necessarily L. H. Oswald, but it could refer to a murderer employed by the presidential office*

Several syntactic and semantic contexts distinguish between the two types of *-er* nominals; for example, modification by adjectives such as *frequent* implies an actual event and is only possible with *-er* nominals which have complement structure.

(6) a. the constant defender of the government's policies
b. frequent consumer of tobacco

(7) *this machine continues to be our only frequent transmitter

As indicated above, for Rappaport Hovav and Levin, the instrumental *-ers* lack eventive readings and hence complement structure (CS). These authors establish a second correlation:

> **Correlation B:** An instrumental reading is possible only for the nominals derived from verbs for which the expression of an instrumental performing a 'subject' role is available.

That is, the external argument generalization holds for [–event] instrumental *-er* nominals, too. To illustrate this, compare the instrument in (8) with the instrument in (9). They differ in that the instrument in (8a) can occur as the subject of a corresponding sentence (8b) while this is not possible for the instrument in (9a) (see 9b).

(8) a. Mary opened the can with the new gadget
b. The new gadget opened the can

(9) a. Bill ate the food with a fork
b. *The fork ate the meat

Instruments of the former type are called *intermediary instrument*, instruments of the latter type are called *facilitating* or *enabling instruments*. These two types of instruments differ in that only the former can be understood to perform the action expressed by the verb (to some extend) independently, a property that qualifies them as subjects of these verbs (Kamp and Roß-

deutscher 1994, Alexiadou and Schäfer 2006 and references therein). Crucially, corresponding instrumental *-er* nominals are only possible for verbs that combine with intermediary instruments.

(10) a. opener (agent or instrument)
b. eater (agent but **not instrument**)

How can these two correlations be derived? In syntactic approaches to nominalization (e.g. Borer 1993, Alexiadou 2001, van Hout and Roeper 1998 to mention a few), the second correlation is actually not discussed. The first correlation is typically captured by the assumption that in (1a–d) a verbalizing head signalling event structure is present which is also responsible for the licensing of CS; in (2)–(3) this verbalizing head is missing and complement structure is, in turn, not licensed.

1.2. Our contribution: same structure for both types of *-er* nominals

In a recent paper (Alexiadou and Schäfer 2008), we presented a finer-grained classification of these nominals which makes use of structural decomposition, as put forth in syntactic approaches to nominalization (see e.g. Marantz 2001, Alexiadou 2001, Borer 1993, to appear, van Hout and Roeper 1998 among others). Importantly, we showed that the ±event classification as well as correlation A that is based on this classification are misleading. We argued that both types of *-er* nominals involve an eventive v-layer. The presence of this v-layer is necessary but not sufficient for the licensing of CS. If even *-er* nominals without CS involve a v-layer, then, obviously, the term "[–event] *-er* nominal" is a misnomer for them. Instead, we argued that the interpretational differences between the two types of *-er* nominals result from different aspectual operators binding the event introduced by v, namely a dispositional vs. an episodic aspect. This move forced us to dissociate the presence of layers introducing events from the licensing of complement structure (see Alexiadou 2009, Harley 2009b for the same conclusion for *-ation* nominalizations). We hypothesized that the different aspectual operators are causally related to the presence vs. absence of CS.

In this paper, we first summarize our recent proposal for the decomposition of *-er* nominals. We then attempt to provide a syntactic explanation to the licensing of CS, substantiating our rather speculative analysis in Alexiadou and Schäfer (2008). Finally, we turn to a discussion of *-er* nominals that do not obey the external argument generalization and propose that these have a different structure.

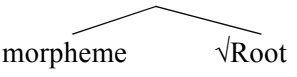
1.3. Our theoretical assumptions

Our proposal is developed within the distributed morphology (DM) framework. The basic ingredients of this framework can be stated as follows (see Arad 2005, Marantz 2001): language has atomic, non-decomposable and category-neutral elements, which we refer to as roots. Roots combine with features, the functional vocabulary, and build larger elements. On this view, words are not primitives. The primitives of word formation are the roots and the functional vocabulary they combine with.

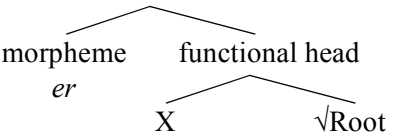
Word categories are determined by category defining functional heads. Derivational endings are part of this functional vocabulary.

Some words are built out of roots. Some others are built out of other words. This means that there are two cycles for word-formation (Marantz 2001), and distinct properties are associated with each one of them:

(11) root-cycle



(12) outer-cycle attachment



Merger with root implies:

1. negotiated (apparently idiosyncratic) meaning of root in the context of a morpheme
2. apparent semi-productivity (better with some roots than others)
3. meaning of construction cannot be an operation on "argument structure" but must depend on root semantics independent of argument structure (see Barker (1998) among others, on this distinction)
4. corollary of the above: cannot involve the "external argument" of the verb

Merger above functional heads implies:

1. compositional meaning predicted from meaning of stem
2. apparent complete productivity
3. meaning of structure can involve apparent operation on argument-structure
4. can involve the external argument of a verb

Adopting the above distinction, we discussed the following properties of *-er* nominalizations: a) the presence vs. absence of morphology related to verbal layers; b) the presence vs. absence of event related semantic effects and c) the productivity and idiosyncrasy of the formation.

Concerning the first property, in many syntactic approaches to nominalization the presence of a verbalizing head signals the presence of event-

structure which, in turn, is taken to be responsible for the presence of complement structure. In other words, a deverbal nominal inherits the complement structure of its verbal source, as a VP is included in the structure of the nominal (e.g. Borer 1993, Alexiadou 2001, though the perspectives vary; cf. Grimshaw 1990). We will stress here that this does not hold; while CS builds on event structure, the presence of event structure does not necessarily imply the presence of CS. Rather the aspectual properties of the constructions are instrumental for the licensing of CS (Borer 2005, Mittwoch 2005).

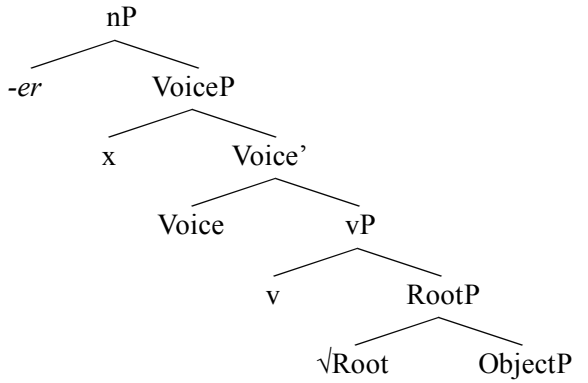
3. Decomposing *-er* nominals

3.1. [+event] *-ers*

In Alexiadou and Schäfer (2008) we argued that the structure involved in the formation of [+event] *-er* nominals is as in (13):

(13) a. [*–er* [VoiceP[vP [RootP]]]]

b.



On this view, all external argument *-er*s (agents, holders, experiencers, …) involve (13). We assumed that the different theta roles related with the external argument are due to 'flavors' of Voice.

Let us briefly summarize our motivation for this analysis. The n-layer is clearly the nominalizer. The main function of this head is to introduce the R-argument and in this particular case it is spelt out as *-er*. R has been argued by Williams (1981) to be responsible for the referential reading of the noun. Grimshaw (1990) states that R is identified with an argument of the base verb. Which argument is identified with R is a function of the affix that is

added, so the affix must specify which argument it binds. For instance, the affix *-ee* binds a patient argument, while the *-er* binds the external argument:

(14) a. detain (y (x)) detainee (R = x) such that y detains x
b. teach (x (y)) teacher (R = x) such that x teaches y

Since all *-er* nouns are referential, we claimed that R is introduced in n, irrespectively of the [±event] classification.

Our analysis of *-er* nominals in terms of (13) is built upon the so called Voice Hypothesis (Kratzer 1996), according to which the external argument is not introduced by the verb itself, but by a semi-functional Voice-projection on top of vP. As mentioned above, the individual denoted by the *-er* nominal is, in its productive use, the one that is the external argument of the event entailed by it (see van Hout and Roeper 1998). We proposed therefore that in these kinds of *-er* nominals the referential argument <R> binds a variable <x> located in Spec,Voice; this derives the 'external argument generalization' and ensures the correct theta role for the *-er* nominal.

We further presented three main arguments in favor of the presence of a vP layer. First, *morphology* offers us some clues suggesting that a verbalizing head is present with such *-er* nominals. In English, many verbs are derived from some non-verbal source (the left column in (15) which involves category-neutral Roots in our terminology) by the addition of verbalizing morphology such as *-ize, -ate* or *-ify*. Under the perspective of DM, these verbalizing affixes are the spell-out of a v-head as their presence is clearly related to the verbal/eventive nature of the verbs in the middle column in (15). Harley (2009b) discusses in detail that affixes like *-ify, -ate* and *-ize* are specific verbalizing morphology. As is shown in the right column of (15), *-er* attaches to these affixes that have verbalized the bare root; this suggests that the verbalizing head is still present.

(15)

ROOT	Root + v	Nominal
√COLON	colon-ize	coloniz-*er*
√MOBIL	mobil-ize	mobiliz-*er*
√DICT	dict-ate	dictat-or
√SPECT	spect-ate	spectat-or
√HTML	html-ify	htmlifi-*er*
√SATIS	satis-fy	satisfi-*er*

A second, semantic, argument comes from modification by adjectives such as *beautiful* and *good*. As is well known, such adjectives are ambiguous, having both intersective and non-intersective interpretations.

(16) a beautiful dancer
  a. x is beautiful and x is a dancer
  b. x dances beautifully

On the first reading, these adjectives modify the <R> argument of the nouns, on the second reading, they modify the event associated with the verb that underlies the *-er* nominals. The fact that this second reading is available suggests that the nominal contains an event variable (cf. Larson 1998). Since the root itself does not introduce this event variable, this must be introduced by the v-head.

Third, the argument why *-er* nominals can't be root-nominalizations comes from the observation that such formations are absolutely productive and non-idiosyncratic. As mentioned in the introduction, while the root cycle is relevant for idiosyncratic meaning composition (e.g. html-ify "put something in the html-format"), the *-er* nominal is transparently derived on top of the root cycle.

Let us now turn to our analysis of [–event] *-ers*. Contrary to other syntactic approaches such as van Hout and Roeper (1998), we claimed that there is no difference in structure between [+event] and so called [–event] nominals. This crucially suggests that a classification along the [±event] dimension is not accurate and rather an aspectual distinction should be made (cf. Ferrari 2005, Ntelitheos 2007 for nominalizations in general).

3.2. [–event] *-ers*

As already mentioned, in Rappaport Hovav and Levin's account, instrument *-er* nominals are quite different from subject *-er* nominals. They are non-eventive and they lack argument/complement structure. In Alexiadou and Schäfer (2008) we proposed that instrument *-er*s also have the structure in (13) by making use of the same reasoning as in the last section.

As we already mentioned in the introduction, Rappaport Hovav and Levin (1992) pointed out that the instrumental reading is possible only for those nominals that are derived from verbs in which the expression of an instrumental performing a 'subject' like role is available. Only when the instrument functions as an intermediary as opposed to facilitating instrument can the corresponding *-er* be formed (cf. the data in (8–10)). This conclusion, namely that only intermediary instruments can be subjects, coupled with the Voice hypothesis, suggests that Voice is present.

Further, instruments seem to contain a vP as they also contain verbalizing morphology. Corresponding to the agent nominals in (15), we find examples which have a preferred instrument interpretation (although an agent interpretation is still possible).

(17)

ROOT	Root + v	Nominal
√VISUAL	visual-ize	visualiz-*er*
√FERTIL	fertil-ize	fertiliz-*er*
√VENTIL	ventil-ate	ventilat-or
√CALCUL	calcul-ate	calculat-or
√HUMID	humid-ify	humidifi-*er*
√AMPLE	ampli-fy	amplifi-*er*

The question that arises is whether we can find the counterpart of event modification with instrumental nominals. We would expect that a *-er* instrumental nominal would behave similarly to the 'beautiful dancer' example above, if it contains a v (eventive) layer. However, when we apply our modification test to this set of nouns, only the event reading is preserved. In other words, no ambiguity involving an intersective reading emerges.[1]

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[1] Note, however, that in English nouns that are not strictly deverbal can easily be associated with typical events and adjectives can modify such events. The nouns in (i) serve as an example. It does not make sense to assume that 'king' or 'horse' involve an eventive v-layer; nevertheless, adjectives can modify events prototypically related to these nouns, e.g. the event of ruling, or running/jumping. This means that adjectives can have access to events which are only associated, not syntactically manifested.

(i) a. John is a just king b. Olga is a fast horse

Moreover, even nouns clearly lacking an event variable can be modified by event adjectives. In this case, the adjectives are taken to scope outside the NP:

(ii) I drank a quick cup of coffee = I quickly drank a cup of coffee

In other words, modification via an eventive adjective does not seem to always coincide with the existence of a corresponding verb as the nominal source (introducing an event variable).

We note that such sentence-scope phenomena are most common with light verb constructions in languages like Spanish and Greek (see the contrasts in (iii) and (iv)), though English seems to be generally more permissive (Salanova 2002):

(iii) a. *kano ena grigoro duche* (Greek)
do a quick shower

b. *perno ena grigoro kafe* (Greek)
take a fast coffee

(18) a. fast elevator b. fast calculator

A similar observation can be made on the basis of Romance data, which is particularly illuminating, as these languages syntactically differentiate to some extent between intersective and non-intersective readings of adjectives. As Cinque (2003) observed, Italian allows two possible positions for attributive adjectives, i.e. prenominal and postnominal. These two positions typically entail slightly different semantic interpretations, with the postnominal one being ambiguous and the prenominal one unambiguous with respect to a range of semantic oppositions, such as stage level vs. individual level, restrictive vs. appositive, intersective vs. adverbial, and so on. In particular, the prenominal position is unambiguously adverbial (i.e. non intersective) in Italian, whereas the postnominal position is, as usual, ambiguous between the two readings, although the interpretation which is out in prenominal position (i.e. intersective) is usually preferred (*uniqueness principle*) (cf. the examples below):

(19) a Un **buon** attaccante (Italian, from Cinque 2003)
b. A forward good at playing forward (nonintersective)
c. #A good-hearted forward (intersective)

(20) a'. Un attaccante **buono**
b'. A forward good at playing forward (nonintersective)
c'. A good-hearted forward (intersective)

If all deverbal *-er* nominals involve a syntactically represented event, this predicts that event modifying adjectives are freer in their distribution if they modify deverbal instrument nouns than with root-derived instrument nouns. The following examples (p.c. Mihaela Marchis, Giannina Iordachioaia) suggest that this prediction is borne out:[2]

(iv) a. ??*ida mia grigori tenia* (Greek)
saw a quick movie
b. ??*na su serviro en a grigoro kafe* (Greek)
should I serve you a quick coffee
(cf. May I serve you a quick cup of coffee)

As pointed out by an anonymous reviewer, the above cases are not fully productive in English and seem to involve a special case of accommodation.

[2] Antje Rossdeutscher (p.c.) suggests the following German examples in order to show that deverbal instruments involve a syntactically represented event which is not present in root derived (non-deverbal) nouns. The point is that only some

(21) a. **o rapida masina* a'. *o masina rapida* (Romanian)
b. **un rapido coche* b'. *un coche rapido* (Spanish)
a fast car a car fast

(22) a. *un rapid calculator* a'. *un calculator rapi* (Romanian)
b. *un rapido calculador* b'. *un calculador rapido* (Spanish)
a fast calculator a calculator fast

Finally, such [–event] nominalizations are totally productive and non-idiosyncratic. This suggests that they are not root-nominalizations.

To conclude, we showed that both, [+event] as well as [–event] nominalizations are structurally identical; they involve both an eventive verbal head as well as an external argument introducing Voice projection. This crucially suggests that the categorization on the basis of the ±event dimension is misleading and should be replaced.

But saying that instrumental *-er* nominals contain an event layer creates a problem when we come to discuss the fact that they lack CS. In this they crucially differ from other external argument *-er* nominals. The ±event categorization of *-er* nominals could capture that. The claim of this approach was that +event necessarily licenses CS, while -event cannot license CS. Before we present our explanation for this difference in the licensing of CS, we note that this means that the relation between CS and event structure is not bidirectional; the presence of CS implies the presence of event structure but not necessarily the other way around.

4. Episodic vs. dispositional *-er* nominals

Recall again the core data that were provided by the ±event approach to *-er* nominals:

(23) a. a coffee-grinder (person or machine)
b. a grinder of (imported) coffee (necessarily a person)

---

but not all types of event describing adjectives can be added to non-eventive instruments (under the same meaning). The noun 'Strahl-er' (spotlight) is derived from 'strahlen' (to shine); the noun 'Lampe' (lamp) is root derived.

(i) *heller Strahler – scharfer Strahler – weiter Strahler – breiter Strahler*
bright shiner – sharp shiner – ample shiner – wide shiner

(ii) *helle Lampe – #scharfe Lampe – *weite Lampe – #breite Lampe*
bright lamp – sharp lamp – ample lamp – wide lamp

(24) a. a wiper (person or tool)
b. a windshield wiper (person or tool)
c. a wiper of windshields (necessarily a person)[3]

As already mentioned, Rappaport Hovav and Levin link the absence of CS to the absence of event interpretation associated with these nominals (p. 133):

> *A grinder of imported coffee* refers to someone who has actually ground imported coffees and thus presupposes that an event of grinding occurred; a *grinder* can refer simply to a machine intended for grinding something without leading to any presupposition about an actual event. Even the compound *coffee grinder* may refer to a machine that need never have ground coffee. Something can be called *a grinder* on the relevant non-agentive interpretation without an event of grinding being presupposed.

Importantly, this difference in the event-presupposition does not strictly correlate with the thematic role of the nominal but with the presence or absence of argument structure. On the one hand, we also find *non-event agentive nominals*. This is the case with occupational nouns; people can be referred to by these *-er* nominals before they have engaged in the activity, if there is no complement structure (25a), but not if there is complement structure (25b).

(25) a. fire-fighter, live-saver, baker, teacher
(educated but not necessarily experienced)
b. saver of lives, fighter of fire …
(necessarily experienced in action)

On the other hand, we also find instrumental nominals that do inherit CS and get an eventive interpretation (*event instrumental nominals*).

(26) a. A protein … that is a potent **inducer** of new blood vessel growth
b. Woks have always been **conservers** of cooking oil as well as fuel

We claimed that both agent and instrument nominals have the full structure in (13) above, i.e. they involve a vP and a VoiceP level. How can we then implement the event/non-event contrast observed by Rappaport Hovav and

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[3] As Rappaport Hovav and Levin 1992 mention, tools can be modified by for-phrases in the sense of "intended for" as in (i). As they discuss, this is arguable not a case of argument structure.

(i) a wiper for windshields

Levin? In Alexiadou and Schäfer (2008), we proposed that in both cases a vP is present, but that the event variable is bound by different operators.

Compare the agents in (25a) with instruments as in (23a/24a,b). The persons are interpreted as "someone intended to V" similar to instruments which are designed for a specific purpose. In other words, these nominals have either specialized profession- or specialized purpose-denoting uses. As such, they denote dispositional properties. On the other hand, the agents in (24b/24c/25b) are actually involved in an action and so are the instruments in (26).

It seems to us that there is a striking parallelism between non-event *-ers* and other habitual constructions in English. Following Mittwoch (2005), we use the term habitual rather freely to include generic and iterative uses. One such environment that shows similar properties is the context of *generic middles* exemplified in (27).

(27) This mountain climbs easily
(Can be true even if no one ever climbed that mountain)

As in the case of [–event] *-ers*, the interpretation of middles is non-episodic. Middles do not make reference to an actual event having taken place; rather they are derived statives (Ackema and Schoorlemmer 1995). The reason for this is that the event variable of the verb is bound by a generic/dispositional operator (e.g. Lekakou 2005). Middles ascribe a dispositional property to the internal argument of the verb, *-ers* to the external argument of the verb. In middles, the external argument may not be syntactically projected, in *-ers* it is the internal argument that is left out. In both, the non-projected argument is semantically available, interpreted as generic ONE. The only way to express such arguments is via the use of the beneficiary P *for* (the NP is again generic (28a, b); in *-er* nominals it can also be an incorporated predicate restrictor (28c)).

(28) a. These books read easily for young children
b. a wiper for windshields
c. can-opener

In middles the verb's event variable (and the implicit external argument) is bound by a generic/dispositional operator (Lekakou 2005).

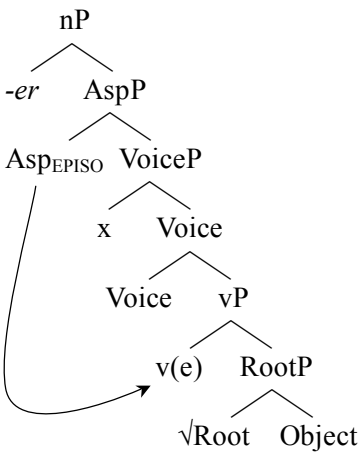
In fact, as Mittwoch (2005) shows in detail, in habitual sentences a large range of verbs permit unspecified objects to be dropped, including many that are not process verbs. For instance, objects can be absent in verbal constructions even with core transitive verbs (29), which normally cannot appear

without their internal argument (cf. also Levin 1999, Goldberg 2001). The important observation here is that these constructions are similar to our *-er* nominals in that they are dispositional, habitual or generic sentences.

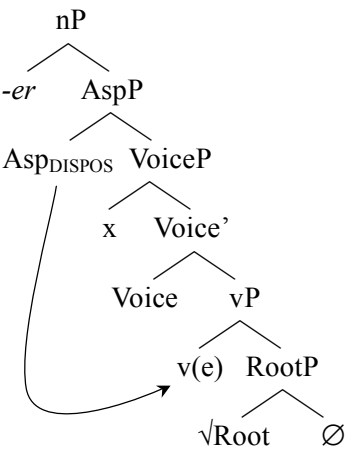
(29) The sewing instructor always cuts ∅ in straight lines

We thus propose that event nominals are episodic, while non-event nominals are dispositional. On this view, the event variable in vP is bound either by an episodic aspect head or by a dispositional aspect head (see also Ferrari 2005 for Italian instrumental nominals, Ntelitheos 2007 for Malagasy instrument nominals).

(30) [+event]-*er*–$ASP_{EPISODIC}$



(31) [–event]-*er*–$ASP_{DISPOSITIONAL}$



We believe that the absence of CS with instrumental/[–event] nominals is related to the specific type of event, i.e. to the presence of this dispositional operator in (31). We would like to derive that from the general behavior of generic/habitual contexts and the availability of unspecified objects in such contexts.

According to Mittwoch, the reason why missing objects are much more common in habitual sentences is the greater likelihood for objects in such environments to be interpreted as unquantized. The claim is that since habitual sentences are imperfective, the quantificational properties of the understood objects are [–delimited quantity], and thus are interpreted as nonspecific. Mittwoch (op.cit.: 247) stresses that by their nature habitual sentences generalize over an unlimited number of situations, and therefore, also over an unlimited number of instantiations of the denotee of the missing

object. Because of the semantic properties of habitual sentences, the missing object is interpreted as a bare noun.[4] In other words, missing objects and bare objects are both interpreted as non-specific, due to the fact that they can never be quantized in such contexts. Note here that Mittwoch's point is that missing objects are facilitated in these environments, not that they are obligatory out. In principle, objects can surface, but when they do, they must satisfy the [–delimited quantity] property of the construction, and thus be interpreted as nonspecific.

We propose that something similar is going on in the case of *-er* nominals. Following Mittwoch, the relevant distinction for the availability of a non-specified/null object is the ±dispositional property, which in case of positive specification goes hand in hand with an unquantized interpretation of objects. Such objects could be present in the lexical semantics of predicates, but need not be projected in the syntax. As discussed by Mittwoch, other nominal constructions provide further support for this view. Consider the following contrast:

(32) a. the felling *(of the tree)
b. Indiscriminate felling is harmful to the environment.

In (32a) the presence of the definite article preceding the nominalization suggests an episodic reading of the nominalized verb. In (32b), the nominal is assigned a habitual reading. While the internal argument is obligatory in (32a) (cf. Grimshaw 1990), it can be dropped in (32b).

This aspectual distinction is crucial both for the interpretation of nominals and the availability of the internal argument. An episodic reading requires the presence of an argument, which is interpreted as a quantity element, i.e. it gives rise to non-homogenous interpretations. As argued by Borer (2005), quantized objects must be located in a specific projection (cf. de Hoop 1996 and others), in which they can check Case, Asp_{episod} in (30). Quantized objects yield telic interpretations of verbal predicates, which would imply the unfolding of an actual event.

Un-quantized objects, on the other hand, as mentioned above, need not be projected in the syntax; but if they do, they must check Case exactly the

[4] Mittwoch derives from the semantic nature of these constructions their information structure properties, cf. Goldberg (2001) who argues that in these cases the indefinite and non-specific patient argument must be predictable from the verb and the sentence context. Furthermore, the patient argument must not be construed as topical or focal and the action of the verb must be construed as emphasized.

same way as bare nominals do. The consensus in the literature is that the Case licensing of bare noun phrases proceeds in a different manner from that of quantized objects (which are taken to be full DPs). This is what we saw in (28): the bare noun either incorporates (see Harley 2009a) or is introduced by the preposition *for*. In other words, the types of objects that are excluded from dispositional nominals are those that have quantized readings. Nouns that have unquantized readings are in, as can be seen in our examples in (28), where the NP is either incorporated or appears after a case licenser, the preposition *for*, but is crucially a bare plural. *For* assigns case to the noun directly, while incorporation is an alternative case licensing mechanism (Baker 1988).

The next question is to offer an explanation for the reason why *of*-PPs are out, while in principle PPs can appear within dispositional nominals. Following Alexiadou (2001), van Hout and Roeper (1998), Borer (2001) we take *-of* insertion to be a realization of structural case licensing related to quantized noun phrases. Given what we have said thus far, we predict this to be out in the case of dispositional *-er* nominals. This is expected under the correlation between the interpretation of the NP (± quantized) and its realization (incorporated vs. of insertion).[5]

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[5] In our analysis, only Asp-episodic licenses quantized arguments; Asp-dispositional is not a Case related position. An alternative analysis is adopted in Ntelitheos's work, who argues that structural Case licensing takes place above Aspect. If this were the case, then the object would have to move there from its base position. In this case then, the dispositional operator intervenes between the base position and the landing side (of) of the object. The operator functions as a weak island for weak indefinites; therefore the reading is blocked. The other, quantized reading is out due to the generic semantics. A similar effect is found with generic middles; the operator acts as a weak island for the *was-für* split construction. This is discussed in detail in Schäfer (2008a). The examples below give a brief illustration. Split *was-für* phrases only have a property reading ("what kind of books") which is known to be sensible for weak islands; this is illustrated in (i) for a sentence negation.

(i) a. *Was* hast du *für Bücher* gelesen
what have you for books read
b. **Was* hast du **nicht** *für Bücher* gelesen
what have you not for books read
'What kind of books have you (not) read'

The examples in (ii) show that generic middles also block *was-für* splits. This blocking is crucially related to the presence of the generic operator in middles which acts as a weak island. This can be seen by a comparison with reflexive

Interesting support for this analysis comes from Ntelitheos's (2007) discussions of Malagasy nominals. Malagasy has two types of instrumental nominals, the f-AT ones, and the f-CT ones. As Ntelitheos points out, only the latter ones can co-occur with DP arguments, and when they do, an event is implied. The f-AT nominalizations can incorporate their internal argument, and in this case no event implication is present. On his view, it is only the structure of the f-CT that contains a projection where the theme is case-licensed.

5. Non-subject *-er* nominals

Some further comments are necessary on the broadness of the 'external argument generalization' which was at the heart of our analysis so far. As has been observed in the literature, not all *-er* nominalizations obey this generalization.[6] The examples in (33) seem to denote the theme, i.e. the internal argument of an underlying verb.

(33) a. baker (a baked potato)
b. broiler (a broiled chicken)
c. scratcher (a lottery ticket that is scratched)
d. bestseller (something that sells well)
e. reader (a compilation of literature to read)

---

anticausatives in (iii) which have the same syntax as generic middles (involving the reflexive pronoun 'sich' but which are eventive (i.e. they lack a generic operator) and allow was-für split formation. The data below where confirmed by a questionnaire involving eight speakers in Schäfer (2008a).

(ii) a. *Was für Aufsätze lesen sich angenehm?* (generic middle)
what for articles read REFL comfortably
b. *??Was lesen sich für Aufsätze angenehm?*
what read REFL for articles comfortably

(iii) a. *Was für Werte haben sich verändert?* (eventive anticausative)
what for values have REFL changed
b. *Was haben sich für Werte verändert?*
what have REFL for values changed

[6] This has even lead to the assumption that it is an epiphenomenon (e.g. Ryder 1999). Here we defend its status as an important generalization that reflects the structure of the corresponding *-er* nominals.

Nominals such as in (33) have an interpretation that is close to the interpretation that the base verb receives in the middle construction. Thus, it was proposed that these nominals are in fact derived from the middle version of underlying verbs where the theme (the argument denoted by the *-er* nominals in (33)) is the (allegedly base generated) external argument of the verb (Rappaport Hovav and Levin 1992; Booij 1986; Heyvaert 1998, 2003).

Besides object denoting *-er* nominals, we also find *-er* nominals denoting the complement of a preposition modifying the verb (where the preposition is often locational). For these types of *-er* nominals, it was also proposed that they can be subsumed under a middle-kind of analysis (at least their Dutch counterparts, Haeyvaert 1998, 2003).

(34) a. diner (a place to dine in)
b. sleeper (a train where one can sleep in)
c. toploader (a washing machine which one loads from the top)
d. kneeler (something [as a cushion or board] to kneel on)
e. jotter (rough book where you make a short notice/sketch)

While examples as in (33) and (34) can be found in English and Dutch, they seem to be hardly present in other languages, for example they occur rather seldom in German.[7] A reason for this difference could be that English and Dutch form morphologically unmarked middles while German marks its middles with the reflexive pronoun '*sich*' (cf. Schäfer 2008a for a proposal which correlates this difference in morphological marking with a difference concerning the syntactic position of the theme in middles; in Dutch and English middles, the theme is a derived external argument, while in German middles, it remains in its VP-internal base position).

Be it as it may, it should, however, be noted that even in languages that allow the kind of *-er* nominalizations in (33) and (34), their formation is certainly not fully productive, but such a nominal has to be accepted in the language community in order to be understood in the right way.[8] A speaker

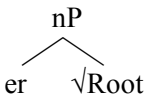
[7] With the exception of loanwords, e.g. 'Toplader' (cf. 34c) (Toplader) and 'Best-seller'.

[8] Booij and Lieber (2004: 351) stress that "it should be kept in mind that this category shows at least some productivity in both languages [English and Dutch]". But they do not explain their usage of the term 'productivity'. What they mean is that there are quite a number of *-er* nominals in the languages that do not obey the external argument generalization. But this use of the term 'productivity' is different from our use where we mean that a derivational process can be produc-

cannot arbitrarily form a *-er* nominal with the intention that this nominal denotes the object of the underlying verb (or object of a verbal preposition), while this is always possible, if the *-er* nominal is ought to denote the subject of a verb. That is, while virtually every verb projecting an external argument allows a *-er* nominal denoting the external argument, only a small subset of verbs allows *-er* nominals to denote what looks like the internal argument. Also, if a new verb is invented (or a non-existing verb is made up) all speakers will accept a *-er* derivation denoting the external argument but nothing else. This suggests that object-denoting *-er* nominals are (in fact need to be) lexicalized. Taking this for granted, it is then a different question why English and Dutch have more of these non-derivational *-er* nominals (Ryder 1999; Booij and Lieber 2004) than for example German or the Romance languages.

An alternative analysis to the middle theory could be, therefore, that these *-er* nominals are actually root-derived and have the structure in (35) below.[9]

(35) [*er* [Root]]



If this hypothesis is correct then we would expect that *-er* nominals such as in (33)–(34) show a number of restrictions.[10]

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tively applied to every base that fulfils a formal property (being a verb). The types of *-er* nominals in (33–34) are clearly not derivationally productive as they need to be memorized in addition to the verb as extra lexical entries. Note also that many of the object denoting *-er* nominals in English are built from specific verbal subclasses (cooking verbs or clothing verbs). Every analysis of *-er* nominals must say something about this difference in productivity between external argument denoting *-er* and other *-er* nominals. The DM-approach provides a hypothesis about this difference (see the discussion below).

[9] The middle theory could still be right in so far as it provides a trigger for the invention of such root derived, i.e. lexicalised *-er* nominals. The fact that English and Dutch form unmarked middles while German and Romance languages form reflexively marked middles could then still be connected to the fact that we find more of these *-er* nominals in the former languages. But these *-er* nominals would not involve a middle syntax or argument structure.

[10] An anonymous reviewer raises the question how *-er* can have the same function in both cases, i.e. both in the structure containing VoiceP and in the one in (35).

First, they should not be productive in the relevant sense. As mentioned above, this seems to be the case.

Second, they should have idiosyncratic interpretations. It seems to us that this is the case, too; if 'baker' is restricted to potatoes, 'broiler' to chickens and 'scratcher' to a lottery ticket, then this is an idiosyncratic selection from the set of things that can be baked, broiled or scratched.

Third, we do not expect to find verbalizing morphology with these *-er* nominals. And in fact, we have not been able to find such examples in the literature.

Marantz (2001) gives the following English examples to show that lack of verbalizing morphology and gain of idiosyncratic interpretation goes

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The idea that we have been pursuing in this paper is that in the former case *-er* binds the variable closest to it, namely the implicit external argument located in Spec,VoiceP. This means that English *-er* selects VoiceP, otherwise we could not explain why unaccusative predicates do not undergo productive *-er* formation.

The requirement on the presence of Voice is specific to English *-er*, an observation that might eventually lead to a different perspective on the selectional properties of the n head forming *-er* nominals even in English. In German, *-er* either binds the external argument (in the presence of Voice) or the verbal event in v (in the absence of Voice). The latter is possible only with a specific class of verbal events, namely "naturally atomic" semelfactives, e.g. *Hüpfer* 'a person who jumps' or 'a jump' (see Schäfer 2008b for discussion). This is not possible in English, where the zero n-affix appears with semelfactive nouns. Schäfer proposes that in English the n head is simply spelt out in a different way in such a constellation. Within the framework of Distributed Morphology, he proposes that the Spell-Out of the n head forming "atomic" nouns (either *-er* nominals or semelfactive nominals) can differ depending on the syntactic context. Following Embick (2003), insertion of Vocabulary items is sensitive to Locality. In other words, the Spell-Out rules for n in English make reference to its c-command domain as suggested by the two rules in (i) from Schäfer (2008b: 186):

(i) Spell-out for n: Voice cycle
n ↔ -er {√JUMP….}
Spell-out for n: v cycle
n ↔ zero {√JUMP….}

Clearly, in the context of root derived English *-er* nominals there is no entity present to be bound, hence the interpretation of the nominal is unpredictable and idiosyncratic. If we wanted to formulate a strong requirement for English *-er*, namely that it always requires an entity, we could assume that in the *diner* examples, this entity is provided by a covert location, as in (ii). It is not clear to us that all examples of this type are amenable to such a locational source:

(ii) $[_{nP}$ -er $[_{RootP}$ dine $[_{PP}$ x]]]

hand in hand. "Donor" and "rotor" have special meanings that the deverbal "donator" and "rotator" lack. E.g. a rotator is something that rotates or causes rotation, but a rotor is a part that revolves in a stationary part, as in a brake rotor or the rotating member of an electrical machine.

(36) a. rotor vs. rotator
b. don-or vs. donator

Finally, these *-er* nominals should not make an event available for syntactic modification. As mentioned, this is hard to test this for English. We might, therefore, want to sidestep again to Romance languages. Recall, that both, [+event] and [–event] *-er* nominals in Romanian and Spanish allow pre- and post-nominal adjectives modifying the event while clearly non-verbal nouns allow such adjectives only in post-nominal position. If our hypothesis is correct that examples as in (33)–(34) are root-derived (i.e. do not involve a verbalizing head but have the structure in (35)) then we predict that Romance counterparts of these *-er* nominals should only license post-nominal adjectives.

It turns out that counterparts of the English *-er* nominals in (33)–(34) are nearly totally absent in Romance languages. The only exception is a number of *-er* nominals that denote locations where events denoted by the correlated verb take place, i.e. counterparts to 'diner' or 'sleeper' above. In (37) we provide three Romanian examples.

(37) a. dormitor – i. a person who sleeps
ii. bedroom
b. observator – i. a person/machine that observes
ii. observatory
c. spalator – i. a person/machine that washes
ii. a room where you do the laundry

The second reading that these *-er* nominals have is not productive in that not every deverbal *-er* nominal has it in addition to its external argument denoting reading. That is, we have to list that 'observator' is not only a person that observes something but also a place where one observes something.

On the basis of our argumentation, we would expect that different readings of the noun correlate with different adjectival interpretations. Indeed applying our modification test from section 3 to such data confirms our analysis: First, note that in Romanian the adjective *fiabil* 'reliable' can only be used to modify objects. Thus (38a) can only mean a reliable observatory. The adjective *bun*, however, 'good' can both modify a human and an object

and thus (38b) is ambiguous. Our analysis predicts that *fiabil* will not be able to appear in pre-nominal position in Romanian. This is indeed confirmed, see (38c) (G. Iordachioaia and M. Marchis, p.c.). In this position, the adjective would need to bring about an event reading, but since it can only modify an object, it is out; *bun*, on the other hand, can appear in pre-nominal position, but only under the first reading, i.e. under the human reference reading (38d), again as expected:[11]

(38) a. un observator fiabil
a observatory reliable
b. un observartor bun
i. 'a reliable observer'
ii. 'a reliable observatory'
c. *un fiabil observator
a reliable observatory
d. un bun observator (can mean i.)
i. 'a reliable observer'
ii. *'a reliable observatory'

If examples as in (33)–(34) are in fact root derived,[12] this does not mean that there are no interesting generalizations to be made about what these root-derived *-er* nominals can denote and why they appear in some languages more

[11] A problem for the analysis of Romanian locational nominals as being root derived is, as Marchis (2008) discusses in detail, that they are built on the basis of the participle, signalled here by the exponent *-t-*. But note that the location readings of these nominals are not very productive. Thus, in principle they could represent cases of lexicalization. This means that the structure is for some reason 'frozen' in interpretation: even if a verbal structure is present it can no longer be accessed.

[12] French has to two different morphemes for the formation of *-er* nominals, '*-eur*' and '*oir(e)*' which are, however, etymologically derived from the same Latin root '*-or*'. Interestingly, the difference between the two is that '*-eur*' tends to specialise for external argument denoting nouns while '*-oir(e)*' forms nouns denoting locations and instruments (the division is not perfect in that some '*-eur*' nouns can denote locations and instruments, too). Under the DM-perspective applied here, we could hypothesize that these morphemes have specialized for different cycles of word formation, '*-eur*' for the outer cycle and '*-oir(e)*' for the root cycle. Concerning modification with adjectives, the prediction would be then that the latter restrict the position of adjectives while the former do not.

often than in others. Here, we think, is the place where studies stressing the relevance of conceptual, cognitive, and pragmatic-semantic factors have a lot to contribute (cf. Ryder 1999). (See also the notion of "pragmatic pressure" in Booij and Lieber 2004.)

This expectation is partly fulfilled (many thanks to Fabienne Martin for her judgements and for explaining to us the complex situation in French). The central intervening problem is that, in French, the distribution of adjectives is freer than it is reported for other Romance languages and it is influenced by a number of different factors, for example the expressive/intensive value of the adjective (cf. Berlan 1992). So while in (i) with a non-verbal noun a prenominal adjective is marginal in an out-of-the-blue context (suspect to variation of acceptability), such structures improve if the adjective carries prosodic accent (ii), is put in the superlative (iii) or if a second, post-nominal adjective is added (iv). Heaviness of the modified noun also has influences ('une rapide automobile' (a fast automobile) is ceteris paribus better than 'une rapide voiture' (a fast car)).

(i) #une rapide voiture
a fast car

(ii) une MAGNIFIQUE voiture
a fabulous car

(iii) une TRÈS / LA PLUS RAPIDE voiture
a very / THE most fast car

(iv) une rapide voiture allemande
a fast car German

It turns out that, abstracting away from these intervening factors, locational nominals (typically formed with '*-oir(e)*') prefer post-nominal adjectives while agentive nominals (typically formed with '*-eur*') allow pre- and post-nominal adjectives (cf. (v) vs. (vi) and (vii) vs. (viii)).

(v) a. un observatoire fiable
b. #un fiable observatoire
'a reliable observatory'
(i.e. an observatory where things are observed in a reliable way)

(vi) a. un observateur fiable
b. un fiable observateur
'a reliable observer'

(vii) a. un guettoir efficace
b. #un efficace guettoir
'an efficient place to watch'
(i.e. a place where the watcher can watch out in an efficient way)

(viii) a. un guetteur efficace
b. un efficace guetteur
'an efficient watcher'

The root-derived analysis would also work for other types of *-er* nominals which are not verb-derived but are derived from adjectival stems (foreigner), prepositional stems (upper, downer, insider), denominal stems (porker, Londoner, villager, Scotland Yarder, teenager) or measure words (fiver) (see Ryder 1999 for a collection of such examples).[13] These types of *-er* nominals are really very frequent and also exist in German, so every theory has to address them (cf. Ryder 1999). Once again, it should be noted that such derivations are, despite their frequency, not fully productive in that we cannot use any adjective, preposition or noun to form a corresponding *-er* nominal. Again, this does not mean that there are no interesting generalizations to be made about what kind of non-verb derived *-er* nominals are

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[13] The literature sometimes gives examples of *-er* nominals derived from alleged unaccusative verbs. But these examples involve verbs that can be reanalyzed as unergatives in the right contexts. Such contexts typically assign control to the sole argument of the verb. In the examples below (from Ryder 1999), the *-er* nominals are either paired with professional nouns (*vanisher* → professional + lawyer, *dyer* → actor) or it is described as controller in a different way.

(i) a. I swear, the moment I need to talk to Max, he's suddenly gone. I'm beginning to think he is a professional *vanisher*, not a lawyer.
b. So many old melodramas end in deathbed scenes that the actors who played in them had to be good *dyers*.
c. One guy jumped right into the fight, but his friend immediately vanished. The police came and hauled off the fighter, after which the *vanisher* promptly reappeared laughing.

Similar *-er* nominals from alleged unaccusatives can be found for German. But their interpretation makes it clear that these verbs have been reanalyzed as unergatives.

(ii) a. 'Umfaller' (fall down-er) is not someone who is fainting but someone who agentively gives up his old opinion.
b. 'Abfaller' (fall away-er) is not something which physically falls apart, but again someone who agentively changes his affiliation with a group, party or idea.
c. 'Durchfaller' (fall through-er) is not something that physically falls through some physical object, but someone who misses his goals in school.

On the other hand, some *-er* nominals with unaccusative bases could also be root derived. As van Hout and Roeper (1998) stress, 'sinker' either means a pitch in baseball or an anchor on a boat, but not a rock sinking to the bottom of the lake. These uses seem to be much more idiosyncratic than the examples in (i) and (ii) which just add an agentive component to the unaccusative base meaning.

possible or not. On the contrary, for example noun-derived *-er* nominals are clearly restricted by the semantics of the noun; while some noun classes do not allow *-er* formation at all (e.g. animals: *doger, *cater, *birder), other noun classes are persistently compatible with *-er* formation and then, the reading these nouns receive is clearly determined by a stereotypical pattern. For example, *-er* nominals from nouns denoting civilizing places (cities, villages, countries, …) denote people who live at this place (but not people who just work there, or have any other relation to the place).[14]

6. Conclusion

To conclude, while the class of *-er* nominalizations which do not denote the external argument of a verb is certainly interesting and amenable to specific generalizations, it seems fair to say that only the formation of external argument denoting *-er* nominalizations is really a productive derivational process within and across languages. The DM approach outlined above gives us a way to handle the differences in productivity; i.e., we would suggest that all *-er* nominals are derived with the same derivational morpheme *-er*, but they differ in that only those which follow the external argument generalization are derived from verbs, all others being derived directly from roots.

In our treatment of *-er* nominals obeying the external argument generalization, we emphasized that the meaning of the nominal is the result of this internal structure, which includes a number of functional layers. The affix itself does not have a semantic contribution; it simply realizes a nominal head. Whatever nominal semantics is there it comes from the combination of n and the lower structure. In the previous section we showed that the interpretation of non-subject *-er* nominals is much more unpredictable. In the DM based approach this unpredictability is seen as the result of root affixation, which creates a domain of non-compositional interpretation. But in principle, one could argue that *-er* makes an important contribution, when it attaches to the root.

Such proposals have been put forth in the literature, especially in the context of lexical morphology. For instance, Booij and Lieber (2004) attempt to provide a unified analysis for both types of *-er* nominals and argue that the *-er* affix does not impose any special semantic conditions on its R

[14] Again, languages differ in productivity; English allows this only with nouns denoting cities or villages (London-er, New York-er), German allows it also with many nouns denoting countries (Engländ-er, Italien-er, …).

argument. As a result, it will always be co-indexed with the highest argument of the base, whatever that is. Semantically, *-er* affixation will produce concrete situational nouns with non-deverbal forms, while it will produce concrete dynamic nouns with deverbal forms.

In DM terms treating non-subject *er* as an element that makes a crucial semantic contribution other than realizing the semantics of n would entail that we view it as part of the list of roots, see Irwin (2006) for an explicit such a proposal. But since its behavior in the non-deverbal case is rather unpredictable a more plausible way to analyse it is to make use of the concept of locality in the sense of Arad (2005): the structure that includes just the root and the categorizing morpheme is not restricted in any particular way in its interpretation. This gives us the right results.

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On the morphological make-up of nominalizations in Serbian

Monika Bašić

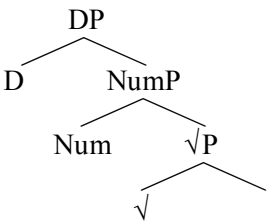
1. Morphological evidence for functional layers

In literature on nominalizations, it is generally agreed that deverbal nominals do not form a homogenous class. Since the seminal work of Grimshaw (1990), at least two types of nominals are distinguished, often called Complex Event nominals (CEN) and Result nominals (RN) (following Grimshaw's (1990) terminology):

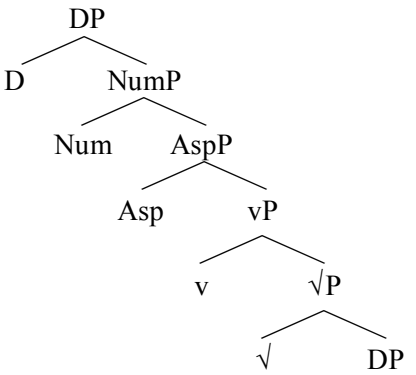
(1) a. *the examination of the patients took a long time* (CEN)
b. *the exam was on the table* (RN)

It has been argued that the two types can be distinguished on the basis of various semantic and syntactic criteria, including the possibility of event interpretation, licensing of argument structure, assignment of accusative case, licensing of adverbs and aspectual modifiers, etc. On structural analyses, these differences between CENs and RNs have been captured in terms of distinct structural representations (Alexiadou 2001; Borer 2003 among others). Consider the structures in (2) and (3) taken from Alexiadou (2001), as an illustration of this kind of approach. On this particular implementation, CENs contain the eventive little *v* head and an aspectual projection, while in RNs the nominalizing affix attaches directly to the root.

(2) Result Nominal



(3) Complex Event Nominal



Though the number and type of functional projections present in CENs vary from one analysis to another, the logic is the same: CENs contain verbal functional structure and thus display certain verbal properties, while RNs have no verbal structure and consequently do not show categorially ambivalent behaviour. This kind of approach seems to be supported by the fact that in many languages morphological markers typically associated with verbs often occur inside nominals. For instance, in Serbian both the verb in (4a), and the event nominal in (4b) contain the prefix (a perfectivity marker), as well as the so-called secondary imperfective suffix (SI), suggesting the presence of an aspectual projection.[1]

(4) a. ***is***-*piti*-***va***-*ti* *optužene*
PREF-ask-SI-INF accused
'to question the accused'
b. ***is***-*piti*-***va***-*nje* *optuženih*
PREF-ask-SI-NOM accused
'questioning of the accused'

However, the problem with using morphological evidence to argue for the presence of functional structure is that there are often no morphological differences between CENs and RNs. Consider examples in (5a) and (5b), to be

[1] Abbreviations are as follows: ADJ – adjectival suffix, AUX – auxiliary, GEN – genitive case, INF – infinitive, NOM – nominalizing suffix, ^{I} – imperfective, ^{P} – perfective, PART – participial suffix, REFL – reflexive, SI – secondary imperfective, SG – singular, PL – plural, TH – theme vowel.

discussed in more detail in section 3, where the verbalizer *-ify* is retained on both the Event in (5a) and the Result reading in (5b).

(5) a. *The modification of the proposal took a long time.*
b. *These proposals are subject to frequent modifications.*

If we take the presence of verbal morphology as evidence that verbal projections are present, then considering that RNs can contain the same morphological markers, we have to conclude that these functional projections occur inside RNs as well. Thus, while their semantic and syntactic properties suggest that CENs and RNs have different structural representations, morphological evidence seems to suggest the opposite. One of the goals of this paper is to propose a possible way of resolving this puzzle. In particular, I will argue that: (i) RNs (may) contain 'verbal' functional layers (contra Alexiadou 2001), (ii) RNs do not however contain eventive little *v* (contra Harley 2009), (iii) the differences between CENs and RNs can be made to follow from distinct structural representations, despite morphological identity between the two types. Data will be drawn mainly from Serbian, which is particularly interesting in this respect due to having rich verbal morphology, but reference will be made to English as well.

The paper is organized as follows. I will start off by reviewing some of Grimshaw's (1990) diagnostics in order to show that the distinction between CENs and RNs can be observed in Serbian as well. I then discuss two pieces of evidence showing that the nominal suffix in Serbian cannot be assumed to attach directly to the root even in RNs. These concern the participial morphology and theme vowels/verbalizers. I then propose how the distinctions between CENs and RNs can be captured in structural terms despite the fact that verbal morphology is present in both types. Finally, I briefly discuss implications that the present proposal has for licensing of argument structure.

2. Complex Event vs. Result nominals in Serbian

Grimshaw's (1990) typology of derived nominals relies on semantic distinction between nouns denoting an event (CENs) and nouns denoting an output/result of an event or simply naming an entity in the world (RNs).[2] Ac-

[2] Grimshaw (1990) in fact distinguishes three classes: result nominals, complex event nominals, and simple event nominals. For now, I will focus on the former two and return to simple event nominals in section 4.

cording to Grimshaw, one of the fundamental differences between CENs and RNs is that only the former are theta-assigners and take arguments. This claim has since been challenged, and I will return to argument-taking capacities of deverbal nouns in section 5. In addition to argument licensing possibilities, Grimshaw (1990) lists a number of other properties argued to distinguish the two classes. These are summarized in the table below.

Result nominals	**Complex Event nominals**
not compatible with verbs of duration	compatible with verbs of duration
no agent-oriented modifiers	agent-oriented modifiers
subjects are possessives	subjects are arguments
by-phrases are non-arguments	*by*-phrases are arguments
no modification by purpose clause	modification by purpose clause
no aspectual modifiers	aspectual modifiers
modifiers like *frequent* only with plural	modifiers like *frequent* with singular
may be plural	must be singular
may be used predicatively	cannot be used predicatively
can be indefinite	obligatorily definite

Most of these diagnostics are applicable in Serbian, sometimes with slight modifications. I briefly discuss a few of these as they will become relevant in the discussion to follow.[3]

First of all, since CENs denote events, they can be located in time or have duration (6a). The same is not true of RNs (6b).

(6) a. *Potpisivanje dokumenata je dugo trajalo.*
signing documents AUX long lasted
'The signing of the documents took a long time'

b. **Potpis je dugo trajao.*
signature AUX long lasted

Only event nominals are compatible with aspectual modifiers. In fact, CENs take the same type of aspectual modifiers as their verbal counterparts. If the noun is derived from a perfective verb, it can take the 'in an hour' adverbial. If it is derived from an imperfective verb, it takes the durative time adverbial.

[3] For discussion of Grimshaw's diagnostics as applied to other Slavic languages, see Schoorlemmer (1995) for Russian, and Procházková (2006) for Czech. For Serbian see also Zlatić (1997).

(7) a. *uručivanje nagrada (po) ceo dan*
awarding[I] prizes for whole day
'Awarding prizes the whole day'
b. *uručenje nagrada za pet minuta*
awarding[P] prizes in five minutes

Result nominals on the other hand, do not allow this type of modification:

(8) **potpis (po) pet minuta/za pet minuta*
signature for five minutes/in five minutes

Result nominals can be used predicatively, event nominals cannot:

(9) a. **Ovo je veoma komplikovano rešavanje zadatka.*
this is very complicated solving exercise
b. *Ovo je veoma komplikovano rešenje zadatka.*
this is very complicated solution exercise
'This is a very complicated solution to the exercise'

The cognate of the agentive *by*-phrase in English, the *od strane*-phrase, can be used with CENs. RNs do not allow *by*-phrases.

(10) a. *Rešavanje postavljenih zadataka od strane studenata je dugo*
solving assigned exercises from side students AUX long
trajalo.
lasted
'Solving of the assigned exercises by students took a long time'
b. **Rešenje postavljenog zadatka od strane studenta je na stolu.*
solution assigned exercise from side student AUX on table

Another distinguishing criterion concerns the distribution of adjectives such as *čest* 'frequent' and *neprestan* 'constant'. While these adjectives can modify CENs, they are not freely compatible with RNs.

(11) a. *Često potpisivanje dokumenata je zamorno.*
frequent signing.SG documents AUX tiring
'Frequent signing of documents is tiring'
b. **česti potpisi su zamorni*
frequent signatures.PL AUX tiring

When they do occur with a RN, the RN has to be marked for plural. On the other hand, such modifiers may appear with singular CENs.[4]

(12) a. *često posećivanje ovih sajtova od strane zaposlenih* (CEN)
frequent visit.SG these sites from side employees
'frequent visits to these sites by the employees'

b. *česte posete nisu dozvoljene* (RN)
frequent visit.PL NEG.AUX allowed
'frequent visits are not allowed'

c. **česta poseta nije dozvoljena* (RN)
frequent visit.SG NEG.AUX allowed

Limiting ourselves to the diagnostics discussed above, we can conclude that Serbian nominals do fall into two classes. One of the goals of the present paper is to propose how at least some of these differences between the two types of nominals can be derived in structural terms.

3. Morphological structure of nominalizations in Serbian

Various proposals have been put forth in an attempt to account for the differences between CENs and RNs discussed in the previous section. According to one family of approaches, the categorially ambivalent behaviour of CENs stems from the presence of functional layers typically associated with verbs (see Alexiadou 2001; Borer 2003 among others). On these approaches, the following claims are made: (i) CENs contain verbal functional structure and therefore display certain verb-like properties, (ii) RN do not contain verbal functional projections. In this section, I will argue that morphological evidence goes against the latter claim, and that both types of nominals can contain functional structure standardly associated with verbs. I will argue that the differences between the two types are not due to the presence of verbal layers in CENs vs. absence of these in RNs, rather what matters is the number and type of verbal projections present.

[4] Grimshaw (1990) argues that modifiers like *frequent* have to occur with singular CENs, since CENs cannot pluralize in the first place. However, it has been shown that the generalization regarding the possibility of pluralization is not valid, see Schoorlemmer 1995; Procházková 2006 for Slavic; and Alexiadou 2007 for a number of other languages.

I will focus on two types of morphological markers typically associated with verbs that can occur inside nominalizations in Serbian: (i) the participial morpheme, and (ii) verbalizers/theme vowels. Apart from these, nominalizations can also contain various aspectual markers (see examples in (4)), which won't receive careful consideration here due to space limitations.

3.1. The participial morpheme

3.1.1. Identifying the participial morphology

Passive participles in Serbian are formed by adding the suffix *-(e)n/t* to a verbal stem:

(13) a. *ispitiva-ti* → *ispitiva-n*
question-INF question-PART
b. *Optuženi su ispitivani od strane policije.*
accused AUX questioned from side police
'The accused were questioned by the police'

The same morpheme seems to occur inside nominalizations:[5]

(14) *ispitiva-**n**-je optuženih*
question-PART-NOM accused
'questioning of the accused'

Alternatively, it could be assumed that the nominalizing affix is *-nje*, which then attaches directly to the verbal stem, as illustrated below (see Zlatić 1997 for Serbian, Schoorlemmer 1995 for Russian, Procházková 2006 for Czech):

(15) *ispitiva-nje optuženih*
question-NOM accused

The two possible parses are illustrated below:

1. stem + PART + NOM
2. stem + NOM

---

5. The nominalizing suffix is *-j*, rather than *je*. The morpheme *-e* is a gender/number/case marker. For reasons of clarity though, I will continue glossing *-je* as the nominalizing morpheme.

On the latter parse there would be no derivational relationship between the participle and the nominalization. However, there is some evidence suggesting that the former approach is on the right track.

Consider in this respect the allomorphy patterns observed with passive participles in Serbian. The participial morpheme has two allomorphs: *-(e)n* and *-t*.[6] The following examples illustrate the pattern:

(16) a. rešiti 'solve' → rešen
b. *rešeni zadac*i
solved problems
c. obećati 'promise' → obećan
d. *obećane povlastice*
promised benefits

(17) a. napuknuti 'crack' → napuknut
b. *napuknuta cev*
cracked pipe
c. uganuti 'sprain' → uganut
d. *uganuti članak*
sprained ankle

The same allomorphy patterns can be observed in nominalizations. If a verb, for instance, takes *-(e)n* in its participial form, it will also take the *-(e)n* suffix in nominalizations.

(18) a. rešen 'solved' → reš-en-je 'a solution'
b. obećan 'promised' → obeća-n-je 'a promise'

(19) a. napuknut 'cracked' → napuknu-t-je → napuknuće 'a crack'[7]
b. uganut 'sprained' → uganu-t-je → uganuće 'a sprain'

---

[6] The choice of the allomorph depends on the conjugation class a verb belongs to. For instance, in (1a) where the thematic vowel is *-nu*, the *-t* allomorph is added, while in (1b) where the thematic vowel is ∅, the *-en* allomorph is attached (note however that in both cases the stem ends in *-u*, suggesting that the process is not phonological).

1. a. napuknu-ti 'to crack' → napuknut 'cracked'
b. ču-ti 'to hear' → čuven 'famous'

Certain verbs allow both allomorphs (sometimes with slight differences in meaning), for instance *dat*/*dan* 'given', *nadut*/*naduven* 'blown up'.

[7] The change from *t* to *ć* is due to a phonological process of iotization. The trigger of iotization does not surface as a separate segment following non-labials.

I take it that this kind of morphological identity cannot be accidental, leading to the conclusion that nominalizations contain the participial morpheme. If we assumed that there was no relationship between the participle and the nominalization, as on the alternative parse, the fact that both forms show the same allomorphy distribution would remain a complete mystery.

Assuming that nominalizations contain the 'passive'-participial morpheme also fits well with the observation that nominals show a number of 'passive' properties. For instance, both in verbal passives and in nominalizations the external argument can be expressed as a *by*-phrase:

(20) a. *Optuženi su ispitivani od strane policije.*
accused AUX questioned from side police
'The accused were questioned by the police'

b. *ispitivanje optuženih od strane policije*
questioning accused from side police
'questioning of the accused by the police'

The lack of accusative case again makes nominalizations similar to passive structures. In Serbian, the complement of the noun receives genitive case.

(21) *ispitivanje optuženih od strane policije*
questioning accused.GEN from side police

The presence of the 'passive'-participial morpheme however does not entail that the process of demoting or absorbing the external argument is necessarily involved. For adjectival passives it has been convincingly argued that the external argument is truly missing (see Kratzer 2000). Yet, the same participial morphology occurs in these constructions as well. Consider the contrast in (22). (22a) is an example of a verbal passive. In this case, the external argument is demoted but is still semantically present, as evidenced by the possibility of licensing agentive adverbials. In (22b), the adverbial *still* is used to force the adjectival passive reading (following Kratzer 2000). In this case, the presence of the agentive adverbial yields an ungrammatical sentence. The form of the participle is however the same in both the verbal and adjectival passive construction, i.e. the *-en* suffix is attached to the verbal stem.

(22) a. *Prozor je (namerno) zatvoren.*
window AUX intentionally closed
'The window has been intentionally closed.'

b. *Prozor je još uvek (*namerno) zatvoren.*
window AUX still intentionally closed

In adjectival passive constructions, the *-(e)n/t* suffix can also attach to unaccusatives as illustrated in (23a). Participial forms of unaccusative verbs also yield grammatical nominalizations, as shown in (23b).[8]

(23) a. *napuknuta cev*
cracked pipe
'the cracked pipe'
b. *napuknuće cevi je izazvalo probleme.*
cracking pipe AUX caused problems
'Cracking of the pipe caused problems.'

3.1.2. Integrating the participial morphology

Let us now try to integrate the participial morphology into the structures (2) and (3), given as an illustration of a structural approach to nominalizations. For CENs, we could assume that the participial morpheme is attaching above *v*, in a projection I have labelled here Part(icipial)P.[9] Attachment above *v* yields a nominal containing features related to eventivity and agentivity, assuming that these are associated with the little *v* head.

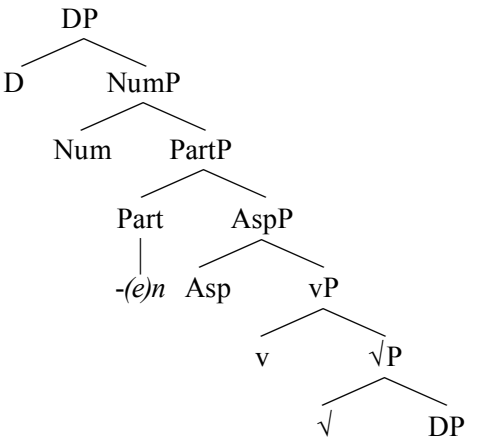
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[8] The *-(e)n/t* suffix attaches also to unergatives in so called impersonal passives, as in (2a). These also produce grammatical nominalization (see (2b)).

2. a. *Po ovoj travi je nedavno trčano.*
on this grass AUX recently run
'Someone has been running on this grass recently'
b. *često trčanje je loše po zdravlje*
frequent running AUX bad for health
'Frequent running is bad for your health'

[9] An anonymous reviewer asks whether there is any difference between PartP and AspP, or if these two projections could be collapsed into a single projection. In principle, this depends on the properties we attribute to AspP and PartP. In (24), I have integrated PartP into the structures proposed by Alexiadou (2001). On this analysis, AspP is responsible for licensing of aspectual modifiers. As shown in section 2, only CENs occur with aspectual modifiers, thus AspP can only be present in the structure of CENs. The participial morphology however occurs both in Result and Complex Event nominals. Therefore, on this implementation, AspP cannot be the locus of insertion of participial morphology. Regardless of the status of PartP and AspP, what is important here is that the projection which hosts the participial morphology cannot be the same as the projection which is associated with the features of eventivity and agentivity.

(24)

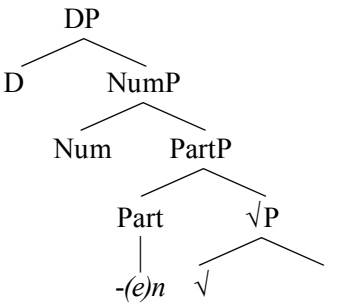


The participial morphology is not, however, restricted to CENs. It also occurs inside RNs, as illustrated in the following examples:

(25) a. *Reše**nja** ovih zadataka su na stolu.*
solutions these problems are on table
b. *Ovo je veoma neuverljivo obrazlože**nje**.*
this is very unconvincing explanation

For RNs, it could be assumed that the PartP attaches directly to the root. This would preclude the appearance of *v* and yield something that lacks eventivity and agentivity (in the spirit of Embick's (2004) analysis of participles in English):

(26)



Considering that the nominalizing suffix attaches outside the participial morphology, the nominalizing affix thus cannot be assumed to attach directly to the root in RNs. Insofar as we consider participial morphology as verbal morphology, then it is clear that at least some verbal functional structure is

present inside RNs. The same conclusion will arise in the next section, where I discuss the presence of verbalizers inside nominalizations, and will lead us to reconsider the structures in (2) and (3).

3.2. Verbalizers/theme vowels

Most Slavic verbs have what is called a *theme vowel*, a piece of morphology intervening between the root and tense/agreement morphemes. Below are some examples of verbs with different theme vowels, with *-ti* being the infinitival suffix. Note that despite the term used, 'theme vowels' can consist of more than just a vowel, as in (27c).

(27) a. obeć-**a**-ti 'to promise'
b. reš-**i**-ti 'to solve'
c. napuk-**nu**-ti 'to crack'

Theme vowels determine the conjugation pattern a given root belongs to. Though their exact status is a matter of debate, some researchers treat themes as exponents of *v* (see Svenonius 2004; Jabłońska 2007). Note that the same root that surfaces as a verb when a theme vowel is present can in many cases occur in non-verbal lexical items as well. As an illustration, consider the adjectives in (28). The adjectival suffixes attach directly to the root and there is no theme vowel.[10]

(28) a. privlač-i-ti → privlač-an
attract-TH-INF attract-ADJ
'to attract' — 'attractive'
b. šir-i-ti → šir-ok
wide-TH-INF wide-ADJ
'to widen' — 'wide'

[10] Peter Svenonius (personal communication) points out that the reason why themes don't surface in these cases might be because the suffix begins with a vowel. While most adjectival suffixes in Serbian are VC-suffixes, the suffix *-ljiv* is an exception. Note that in this case as well there is no theme vowel:

3. prič-a-ti 'to talk' → prič-ljiv 'talkative'

Not all nominals contain theme vowels either. In example (29), the nominalizing suffix *-ba* attaches directly to the root. Nominals derived from 'verbal roots', but without theme vowels, generally pattern like RNs.[11]

(29) a. mol-i-ti → mol-ba
ask-TH-INF ask-NOM
'to ask' — 'a request'
b. bor-i-ti se → bor-ba
fight-TH-INF REFL fight–NOM
'to fight' — 'a fight'

Although typically a root occurs with one theme vowel, attachment of different thematic vowels to the same root, in cases where this is possible, can have semantic effects. In (30), the change of the theme vowel reflects the change from the causative to inchoative use (from Milićević 2004):[12]

(30) a. izlud-**e**-ti 'go crazy' vs. izlud-**i**-ti 'drive crazy'
b. oslep-**e**-ti 'go blind' vs. oslep-**i**-ti 'blind'

If theme vowels are indeed verbalizers, this raises problems for current structural analyses of nominalizations. Recall that RNs were argued to lack verbal functional structure, including in particular the little *v* head. However, if theme vowels are instantiations of *v*, then it must be concluded that *v* is present in the structure of both types of nominals after all, since the same piece of morphology can appear inside RNs:[13]

(31) a. obeć-**a**-nje 'a promise'
b. napuk-**nu**-će 'a crack'

---

[11] By 'verbal' I mean here 'typically associated with verbs', rather than implying that roots have a category.

[12] Detailed investigation of themes in Serbian is beyond the scope of this paper, but I refer the reader to the careful analysis of theme vowels in Polish in Jabłońska (2007), whose general approach to the nature of theme vowels is adopted.

[13] The presence of the thematic vowel in verbs of *-i* conjugation class is obscured due to the process of iotization, but its underlying presence is revealed on the preceding consonant:
4. *nos-i-ti* → *noš-en* → *noš-en-je*
wear-TH wear-PART wear-PART-NOM
'to wear' — 'worn' — 'wearing'

The presence of theme vowels inside RNs not only suggests that RNs contain verbal layers, but it leaves us with the same structure for both types. The crucial structural difference argued to distinguish CENs from RNs, the presence of little *v*, disappears. If *v* is the locus of agentivity and eventivity and it is present in both types of nominals, then we must seek an alternative explanation for syntactic and semantic differences between CENs and RNs.

3.3. Verbalizers in English

The same kind of problem as the one regarding verbalizers in Serbian arises with nominalizations in English (see also Alexiadou 2009 for Greek). I will go through the English pattern, before outlining the solution in the next section.

Harley (2009) argues that the following suffixes are instantiations of *v* in English (see also Embick 2004):

– *-ify* : modify, clarify, qualify, testify
– *-en* : deafen, broaden
– *-ize* : categorize, stabilize, creolize
– *-ate*: complicate, deteriorate, vibrate

When these suffixes occur inside nominalizations, the nominalizing morpheme must be attaching above *v*P. This raises no serious problems in the case of event nominals, under the assumption that they contain *v*, which can serve as the insertion site for verbalizers. However, as Harley (2009) notes, the same verbalizing morphology is retained on the result reading of these nominals:

(32) a. *The modification of the proposal took a long time. (CEN)*
b. *These proposals are subject to frequent modifications. (RN)*

As in the Serbian cases, the presence of verbal morphology inside RNs is problematic for structural approaches, at least those endorsing the assumptions of Distributed Morphology (DM). Since the shift from complex event to result reading does not affect the internal morphological structure of the nominalization, Harley (2009) points out that a DM-style approach has to accept that RNs contain all they need to denote events. In other words, the morphology tells us that the difference between the two types cannot be characterized by loss of internal verbal structure. Why is that?

Here are the main assumptions of DM that are relevant for the present discussion (based on Harley 2009):

– words are put together by the syntax and a post-syntactic morphological component
– Vocabulary Items are inserted into *terminal* nodes of a hierarchical structure built by syntax
– the terminal nodes are fully featurally specified and are realized post-syntactically by Vocabulary Items
– Vocabulary Items may be underspecified for feature content and compete for insertion into a terminal node, in accordance with the Subset Principle which allows a lexical item to be inserted if it contains all or a subset of features specified in the node

Assuming then feature specifications defining different 'flavours' of *v*, as given in (33), the range of event types each verbalizing suffix is able to derive is captured via underspecification. For instance, the Vocabulary Item *-ify* would only be specified for the feature [+dynamic].

(33) a. v_{caus}: [+dynamic], [+change of state], [+cause]
b. v_{become}: [+dynamic], [+change of state], [–cause]
c. v_{do}: [+dynamic], [–change of state], [–cause]
d. v_{be}: [–dynamic], [–change of state], [–cause]

(34) *-ify* → [*v*[+dynamic]]

What this means however is that *-ify* always signals the presence of little *v* in the structure. Given the assumptions of Distributed Morphology, the necessary conclusion is that little *v* must be present, whenever verbal morphology is there. This gives rise to the following puzzle: if all word-formation is syntactic, and presence of verbal morphology tells us that verbal structure is there, then (i) what makes derived nominals different from verbs, and (ii) what makes RNs different from CENs? Given the conclusion that both CENs and RNs contain little *v*, Harley (2009) points out that the differences between CENs and RNs cannot be made to fall out from syntactic structure, but must be attributed to something else.[14]

[14] It is not clear what this 'something else' should be. Harley (2009) speculates that at least argument licensing possibilities could be linked to Number. This proposal rests on the assumption that CENs cannot pluralize. However, as already pointed out (see footnote 4), it has been shown that this assumption is not valid for a number of languages.

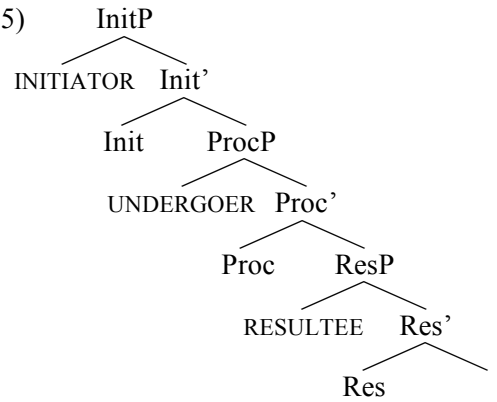
Rather than seeking an alternative to the syntactic approach, I will try to maintain an analysis in terms of distinct structural representations for CENs and RNs. The challenge is thus to derive the differences between these two types of nominals from distinct structural representations, while at the same time accomodating the shared morphology.

4. The proposal

We have seen that Event and Result nominals, in both English and Serbian, can have the same morphological structure, including the presence of 'verbalizing' morphology. The goal is to develop a syntactic analysis of nominalizations that can account for the presence of verbal morphology, but the absence of some (in case of CENs), or nearly all (in case of RNs) syntactic properties associated with the verb phrase.

I will start by adopting the verbal decomposition along the lines of Ramchand (2008).[15] The three core projections on Ramchand's (2008) account are Init(iation)P, Proc(ess)P and Res(ult)P, as illustrated below. The specifier positions host the thematic participant in the particular subevent.

(35)



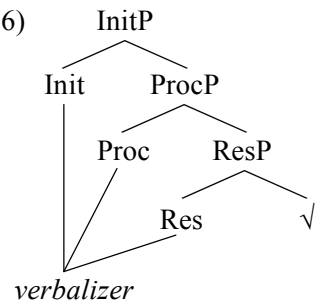
Secondly, I will follow a DM-style approach in assuming that all word-formation is syntactic, but I will abandon the assumption that lexical items are

[15] The details of Ramchand's analysis are not important at this point and I adopt it mostly for concreteness' sake. Equivalent projections can be found on other proposals. However, the current proposal shares another assumption with Ramchand's approach, namely that a single lexical item can be associated with more than one syntactic category.

necessarily inserted under a single terminal node. Rather, a single Vocabulary Item can lexicalize (or be associated with) a number of syntactic heads (see Ramchand 2008; Starke 2006; Caha 2007 and references therein).[16] A particular morpheme can spell out a sequence of syntactic heads if these are adjacent to each other, i.e. a single morpheme can lexicalize one or more heads that select each other's maximal projections (Abels and Muriungi 2008). Vocabulary Items may be 'overspecified' in the sense that they can contain more features than are present in the node(s) they are exponents of (cf. to 'underspecification' in DM). The spell-out of syntactic structure is regulated by the Superset principle, which allows a Vocabulary Item to be inserted if it contains all or a superset of features specified in the node(s) (Starke 2006; Caha 2007).

This means that if a lexical entry of a verbalizer in English or a theme vowel in Slavic contains the features [Init, Proc, Res], it will be able to lexicalize all three projections, as represented below, or a subset of these. Thus depending on the features specified in its lexical entry, a particular verbalizer could lexicalize different sub-sequences of the proposed functional sequence.

(36)



From this perspective, we might view different types of nominalizations as corresponding to different chunks of the structure in (36). The structure of a nominal on the Complex Event reading would roughly correspond to (37).[17]

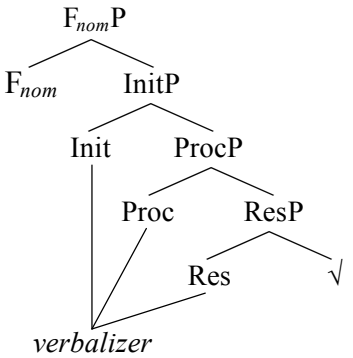
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[16] For discussion and critical evaluation of the tools used in DM to mimic the effects of phrasal spell-out see Caha (2007).

[17] For now, I am glossing over the question of whether additional functional projections might be present. Furthermore, for the sake of simplicity, the nominalizing suffix is represented here as lexicalizing a head in the nominal functional sequence. It is however more plausible that the nominalizing suffix spans a number of syntactic heads as well. Since this doesn't directly affect the discussion at this point, I will stick to this simplified representation.

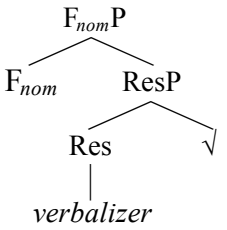
The presence of Init allows for an 'Initiator', capable of surfacing in the form of a *by*-phrase. Init is also responsible for other properties related to agentivity, such as licensing of agentive adverbials. The availability of the so called 'event' or 'process' interpretation is attributable to the presence of the dynamic component Proc.

(37)



Result nominals would have the structure in (38). The verbalizer can be inserted in the Res head, if its lexical entry contains this feature. Note that the Superset principle allows for lexical features to be ignored. Thus, nothing goes wrong if the verbalizer lexicalizes only the Res head, even if its lexical entry contains more features.[18]

(38)

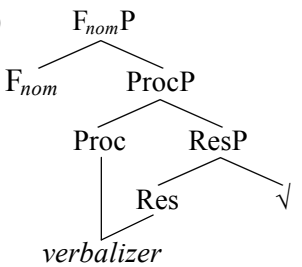


[18] This is in contrast to the Subset Principle of Distributed Morphology, which does not allow any lexical features to be ignored. Within the framework of DM, the only way we could insert a verbalizer such as *-ify* in both structures above would be via underspecification. We could assume that *-ify* is specified only for the Res feature. As a result, *-ify* could be inserted in both environments. There are several drawbacks to this kind of approach though. First of all, it would have to be assumed that the dynamic Proc head, and the agent-introducing head are always null. Furthermore, Res would have to be present in all cases where we see 'verbalizing' morphology. This might be problematic for a number of reasons, some of which will become apparent further on.

The structure of Result nominals is much impoverished in comparison to the structure of CENs. The absence of Init accounts for the lack of the external argument and other properties related to agentivity. More importantly, however, RNs also lack the projection representing the dynamic process, namely ProcP.

Finally, the structure in (39) could correspond to so called 'Simple Event' reading of nominals.

(39)



On their Simple Event reading, derived nominals behave like Complex Event nominals in that they have 'event' interpretation (and are thus compatible with verbs of duration), but are like Result nominals with respect to other properties.

(40) a. *the examination lasted for hours* (Simple Event nominal)
b. *the examination was on the table* (Result nominal)

Going through the list of properties that distinguish Result from Complex Event nominals, it can be observed that many of these have to do with agentivity. That Simple Event nominals pattern in this respect with Result nominals is expected, since they both lack InitP. The property where SENs and RNs differ, the availability of 'event' interpretation, is attributable in our terms to the presence of ProcP. Other properties argued by Grimshaw (1990) to distinguish Event from Result nominals, such as licensing of argument structure and compatibility with aspectual modifiers, will be discussed in the following section.

Adopting a Ramchand-style decomposition, we therefore expect at least three different types of nominals, correlating with three different structural representations, rather than a binary split between CENs and RNs. In principle, the more fine-grained we go, there will be more potential cut-off points and thus more 'types' of nominals emerging.[19]

[19] An anonymous reviewer wonders whether Harley's features in *v* and the syntactic heads assumed here are just notational variants. In fact, Harley (2009)

What follows from the discussion so far is that both CENs and RNs (can) contain 'verbal' functional layers. Nevertheless, the two types of nominals do have different structural representations, in that CENs have *more* 'verbal' structure than RNs. Assuming a rather fine-grained functional sequence, what is meant by 'more' can vary from one language to another, which is a welcome consequence considering that CENs do not always exhibit the same set of properties across languages. For instance, while in English and Serbian the accusative case is not available inside CENs, Hebrew CENs do license accusative case. As illustrated in (41), the theme argument is introduced by the accusative marker *'et* (from Alexiadou 2001):

(41) *ha-harisa* *šel-* *ha-cava* *'et* *ha-'ir*
the-destruction of the-army ACC the-city
'The army's destruction of the city'

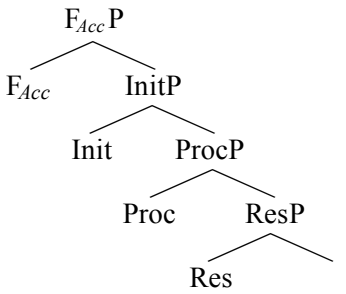
I will assume that the accusative-case-checking head is distinct from and appears outside of the external-argument-introducing head (see also Harley 2009). CENs in Hebrew can contain this case-checking head, while English and Serbian CENs are formed on top of InitP, with no F_{Acc}P above it.[20]

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herself notes that an analysis in terms of different flavours of little *v* runs into problems once nominalizations are taken into account. For instance, *-ify* must be able to lexicalize v_{CAUS} since it can occur on causative verbs. If what makes causative verbs different from unaccusatives is their ability to introduce external arguments and license accusative case, then whenever *-ify* is present in nominalizations, the external argument and the accusative case should be available as well, but they are not. Harley (2009) thus concludes that these features must occur as distinct syntactic heads (thus in effect giving up an analysis in terms of different flavours of *v*), and hence be excludeable from nominalizations. She then proposes a split-VP structure, very similar to the one assumed here, with an Agent head, a Case head and a verbalizer *v*. Nevertheless, even assuming that *-ify* lexicalizes only the little *v* head, Harley (2009) still runs into problems in accounting for the difference between Complex Event and Result nominals, as discussed in the main text.

20. There might be language-internal variation as well, related to the choice of the nominalizing affix. Whereas *-(a)tion* nominalizations in English cannot license accusative case, *-ing* nominals can.

(42)



Under the present approach, what Grimshaw calls Complex Event nominals can in fact correspond to several structural types.[21] Nominals will show different properties depending on how much functional structure they contain. Thus, only a subset of event nominals will license agentive *by*-phrases and modifiers, namely those that contain InitP; while only nominals that have reached the level of F*Acc*P will be able to license accusative case. A few words are in order now regarding argument-licensing capacities of nominals.

5. Licensing of argument structure

The question of whether nouns license argument structure has been one of the central issues in the literature on nominalizations. For Grimshaw (1990), this is one of the fundamental properties distinguishing CENs from RNs. Only Complex Event nominals, she argues, have argument structure, Simple Event and Result nouns do not take arguments.

On the approach developed here, different predictions are made with respect to licensing of external and internal arguments. Since external arguments are introduced in the Spec of InitP, they are predicted to be impossible whenever Init is absent from the structure. As a result, Simple Event and Result nominals are expected not to license external arguments.

Internal arguments, on the other hand, can be introduced in the Spec of ResP, and therefore there is no reason to expect that internal arguments

[21] Result nominals may also correspond to more than one structural type. Namely, there is another option of deriving a nominal that would lack the dynamic ProcP, and that is by attaching the nominalizing morphology directly to the root. This would plausibly be the right representation for Serbian nominals lacking thematic vowels, some examples of which are illustrated in section 3.

should be impossible with Result nominals. Thus, contrary to claims made in Grimshaw (1990), the conclusion reached here is that the presence of argument structure cannot be the distinguishing criterion between CENs and RNs.

The claim that argument-taking capacities of nouns correlate with semantic interpretation, such that only complex-event-denoting nouns take arguments, has already been challenged in the literature (Alexiadou 2001; Schoorlemmer 1995; Procházková 2006). What is often noted is that Result nominals *can* have arguments, but in contrast to verbs, RNs do not take their arguments obligatorily.[22] On the other hand, it is claimed that CENs require their internal arguments to be obligatorily expressed and are thus more like verbs in this respect. The presence of external arguments is always optional.

In fact, if we divorce the notion of obligatoriness from the notion of argumenthood, a different generalization emerges: both event-denoting and result-denoting nominals can in principle have internal arguments, but only with CENs are these arguments obligatory. Thus, what we need is an explanation of why internal arguments are optional with RNs, but obligatory with CENs. The behaviour of CENs in Slavic gives us a clue as to what the answer might be and at the same time reveals that even this generalization needs to be modified.

Obligatoriness of internal arguments does not seems to be related to 'eventivity' since many clearly eventive nominals do not have to appear with overt arguments. This is true of both English and Serbian. Grimshaw (1990) was aware of this fact, and used the term 'Simple Event' reading for such cases.

(43) a. *The examination lasted for hours.*
b. *Ispitivanje je trajalo satima.*
examination AUX lasted hours

If 'eventivity' is not the key factor in determining the obligatory presence of arguments, then what is? In Slavic, event nominals can drop their internal arguments whenever their corresponding verbs can do so. This is often

[22] It should be noted that Grimshaw (1990) acknowledges that RNs can have complements, but she reserves the term 'argument' for *obligatory* complements of the noun. Therefore, her claim that RNs do not have argument structure should be re-evaluated accordingly.

possible with imperfective verbs and event nouns derived from them, as illustrated below (examples are from Zlatić 1997):

(44) a. *Ja objektivno ocenjujem.*
I objectively grade[I]
'I grade objectively'
b. *Moje ocenjivanje je objektivno.*
my grading[I] AUX objective
'My grading is objective'

On the other hand, perfective verbs and the eventive nouns derived from them require overt presence of their internal arguments:

(45) a. *Oni su uručili *(nagrade).*
they AUX award[P] prizes
'They awarded the prizes'
b. *Uručenje *(nagrada) je trajalo nekoliko minuta.*
awarding[P] prizes AUX lasted few minutes
'Awarding of prizes lasted a few minutes'

Although careful investigation of the conditions under which omission of internal arguments is licit in Serbian is beyond the scope of this paper, the pattern above suggests that it is at least to some extent dependent on aspectual properties. Procházková (2006) reaches this conclusion for Czech and argues that obligatoriness of internal arguments is sensitive to [+/–Perfective] value of the aspectual head. Pending further research, I will adopt this proposal for now.[23]

I will thus assume that an aspectual head is present in CENs. This assumption is supported by the presence of aspectual morphology, as already noted in section 1. Perfective verbs in Slavic are derived by attaching a pre-

[23] An anonymous reviewer wonders why objects should be tied to aspect rather then Aktionsart. Note however that I assume that the ability to license arguments depends on the presence of different subevents, rather then on aspect. As pointed out, since ResP is able to introduce an internal argument and can be present in both CENs and RNs, we expect both types of nominals to occur with internal arguments. What does seem to depend on the aspectual properties in Slavic (i.e. on perfective/imperfective) distinction is whether or not the internal argument must be overtly expressed. Admitedly, the latter claim is just a hypothesis at this point, which needs to be tested more carefully.

fix to an imperfective verbal stem. They can then be further imperfectivized with the help of a secondary imperfective suffix. The relevant examples are repeated below:

(46) a. ***is***-*piti*-***va***-*ti* *optužene*
PREF-ask-SI-INF accused
'to question the accused'
b. ***is***-*piti*-***va***-*nje* *optuženih*
PREF-ask-SI-NOM accused
'questioning of the accused'

In addition, CENs in Slavic allow the same set of aspectual modifiers as their verbal counterparts, showing that these are also dependent on the presence and the value of AspP.

(47) a. *Oni su uručivali nagrade ceo dan.*
they AUX awarded[I] prizes whole day
b. *Uručivanje nagrada (po) ceo dan*
awarding[I] prizes for whole day
'Awarding prizes the whole day…'

(48) a. *Oni su uručili nagrade za pet minuta.*
they AUX awarded[P] prizes in five minutes
b. *uručenje nagrada za pet minuta*
awarding[P] prizes in five minutes

Turning now to RNs, on the analysis pursued here, RNs lack the dynamic Proc head and all the higher functional projections. In other words, RNs would not contain AspP either.[24] This should have at least two consequences: (i) RNs should be incompatible with aspectual modifiers since these are licensed by AspP; (ii) RNs should never require their internal ar-

[24] An interesting question to ask is in what sense are prefixes truly perfectivity markers, considering that they often appear on RNs, as in *pot-pis* (PREF-write), meaning 'signature'. Following several recent analyses of prefixes in Slavic I assume that (lexical) prefixes are generated low, in the prepositional domain (see Svenonius 2004). They become markers of perfectivity, only in the presence of AspP, plausibly by movement to the aspectual projection. This implies that the sheer presence of a prefix doesn't automatically give rise to perfectivity.

guments to be obligatorily expressed since obligatoriness of internal arguments is dependent on the value of AspP. Both of these predictions are borne out. Example (49b) shows that an internal argument is optional with a RN, despite the fact that the nominal seems to be derived from a perfective verb. That aspectual modifiers are also impossible is illustrated in (49c).

(49) a. *On je rešio *(zadatak).*
he AUX solved^{P} exercise
'He solved the exercise'

b. *Rešenje (zadatka) je na stolu.*
solution^{P} exercise AUX on table
'The solution to the exercise is on the table'

c. **rešenje (zadatka) za pet minuta*
solution^{P} exercise in five minutes

To summarize, we've seen that licensing of argument structure cannot be a criterion distinguishing Event from Result nominals. As predicted in the system outlined here, both types of nominals can in fact license (internal) arguments, though these are not always overtly expressed. Omission of internal arguments is always possible with RNs. With Event nominals, the obligatoriness of internal arguments seems to correlate with aspectual properties; nominals derived from imperfective verbs allow their internal arguments to be dropped, those derived from perfective verbs do not. I have argued that this might be captured by linking the obligatoriness of internal arguments to the value of the aspectual head. AspP is absent from the structure of RNs, which is why RNs never require their internal arguments to be overtly expressed, and why they are incompatible with aspectual modifiers.

6. Summary and conclusions

In this article, I have tried to meet the challenge that the presence of complex morphological structure inside deverbal nouns raises for structural approaches to nominalizations. Assuming a syntax-based approach to word structure, the goal has been to provide an analysis that would account for the presence of verbal morphology inside nominalizations, but the absence of some or nearly all syntactic properties typically associated with verbs. The proposal relies on a rather fine-grained decomposition of verb phrases, in combination with a particular view regarding the spell-out of syntactic structure. In particular, I have assumed that a Vocabulary item need not be

inserted under a terminal node and can lexicalize several syntactic heads. Depending on the features specified in its lexical entry, a particular Vocabulary item can thus lexicalize different subsequences of the proposed functional sequence, in accordance with the Superset principle. I have argued that with these assumptions in place, it is possible to maintain different structural representations for so called Complex Event and Result nominals despite the fact that they often have the same morphological shape.

Focusing on the presence of participial morphology and verbalizers in Serbian, I have further argued that morphological evidence points to the conclusion that both CENs and RNs can contain functional layers typically associated with verbs. At the same time, I have shown that the presence of 'verbal' morphology in RNs does not necessarily imply the presence of the 'eventive' little *v* head. In the system developed here, what distinguishes CENs from RNs is therefore not the presence of verbal functional structure per se, but rather the number and type of functional projections that each type of nominal contains. Moreover, there isn't a unique syntactic structure for what Grimshaw (1990) calls Complex Event nominals. Depending on how fine-grained our functional sequence is, we expect there to be many 'types' of nominals, correlating with different structural representations, rather than a binary split between CENs and RNs.

The conclusion reached with respect to argument-licensing capacities of nominals is that the differences between CENs and RNs is not one of argument structure, since both types of nominals can take internal arguments. What obscures the picture is the fact that internal arguments are often not obligatorily expressed, and at least for Slavic there are reasons to believe that obligatoriness of internal arguments is related to aspectual properties, rather than to 'eventivity' of the noun.

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A syntactic account of affix rivalry in Spanish nominalizations

Antonio Fábregas

1. Affix rivalry in nominalizations

One of the main problems that a syntactic approach for word formation encounters is the fact that apparently equivalent affixes compete to derive words of a certain class, in such a way that, seemingly, different bases require different affixes. For example, in the case of event nominalizations[1] (Grimshaw 1990; Alexiadou 2001; Harley 2009) in Spanish, there are three productive affixes (1); the affix (1c) is identical to the past participle, in masculine and feminine form.

(1) a. *-ción*: *construc-ción* 'building', *fun-ción*, 'function/session'…
b. *-miento*: *sanea-miento*, 'sanitarization', *estrangula-miento*, 'strangling'…
c. *-do*/*-da*: *sella-do*, 'sealing', *llega-da*, 'arrival'…

Crucially the referential properties of the nominalizations constructed with these different affixes are identical in important respects: they all can produce the same type of event nominalizations. This is what has been known as affix rivalry, to the extent that we have different affixes that give identical results.

There are a number of different approaches to the phenomenon of affix rivalry. In a Lexicalist framework (Halle 1973; Scalise 1984), affix rivalry is accounted for as one of the possible idiosyncrasies of the base: each stem contains particular information about the affix that is required to act as a nominalizer. Distributed Morphology, a framework where word formation is syntactic in nature but the spell out of syntactic features is subject to different operations in the phonological branch of the grammar, uses a similar procedure: even if the syntactic representation of the event nouns in (1) is identical, each morphophonological matrix of features that can spell out the

[1] In this paper, 'event nominalization' will be used as a cover term to refer to complex event nouns and event nouns (Grimshaw 1990).

base contains information about the vocabulary item that needs to be used to spell out the nominalizer head (cfr., to illustrate this strategy, Alexiadou 2004 on Spanish gender inflection). Other approaches have tried to relate rivalry to psycholinguistic notions such as the complexity of parsing some sequences of affixes (Hay and Plag 2004) or a general mechanism of analogy that primes an affix because it frequently co-occurs with another one.

In this article we will pursue a syntactic approach not only to word formation, but also to affix rivalry, and we will show evidence that the choice between the three productive nominalizer suffixes presented in (1) is not idiosyncratic or motivated by general principles of parsing, but is due to the syntactic and (structural) semantic properties of the base. This approach makes clear predictions with respect to the properties of the event nominalizations constructed with different affixes (2).

(2) a. Structural properties of the verb, and their semantic reflects, determine the distribution of an affix.
    b. Thus, if a verb allows more than one construction, we expect this verb to have more than one event nominalization with specific syntactic-semantic properties.
    c. The event nominalizations will have different syntactic and semantic properties depending on the affix used.

An independent question relates to the structural properties that determine the distribution of a set of affixes. We will argue that in the case of Spanish event nominalizations the relevant properties have to do with the argument structure[2] – specifically, the nature of the internal argument – of the verb, but, as far as we can see, this is not a logical consequence of the approach. In fact, Martin (2010) argues that the relevant criterion in French for a similar rivalry is closer to the aspectual class of the verb.[3]

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[2] For the general view of argument structure assumed here, cf. Ramchand (2008).

[3] We will argue that the (a)telicity of the main verb *per se* does not influence the distribution of the suffixes in Spanish, although the presence of the affix may indirectly change some property of the aspectual structure of the verb. For example, the same verb, *recoger*, 'collect', which is telic per se, takes two nominalizations, *recogi-miento* and *recogi-da*, without any change in its aspectual properties – but with changes in other crucial parts of their behavior. This may be the reflection of a parametric difference between the way in which aspect is grammaticalized in French and Spanish; for example, the absence of two verbs *ser*/*estar* in French to grammaticalize aspectual differences may be a hint that aspectual properties are dealt in a more external layer of the word, and, there-

2. Nominalizers and internal arguments

In this section we will show that the distribution of the three affixes can be captured by paying attention to an independently motivated difference between two classes of internal arguments. Therefore, let us make our assumptions about internal arguments explicit before proceeding to the account.

Different researchers (Verkuyl 1972; Krifka 1986; Tenny 1987; Ramchand 2008) have noticed that a class of direct objects – so-called incremental themes – measure the different aspectual phases of the event, while others don't. We will follow Ramchand's (2008) terminology.

The first class is rheme path objects. They are internal arguments that co-describe the event and whose referential properties – mass/count distinction, plurality – have an influence on the telicity or atelicity of the predicate. These objects behave semantically like paths: their extension can be represented as a series of points which are mapped into the aspectual structure of the verb. In (3a), *sopa*, 'soup', being a mass noun, can be categorized as an unbounded path, in such a way that, when the points of this path are mapped into the aspectual structure of the verb *comer*, 'to eat', the verb will be atelic. In contrast, the count noun *pastel*, 'cake', in (3b) is a bounded path with a finite series of points; when the final point of the path is met, the event culminates, and, therefore, the predicate *comer* is telic when this object is selected.[4]

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fore, we expect nominalizations constructed over this layer to interact with it; in Spanish, aspect is grammaticalized in lower positions and the nominalization may not be sensitive to this kind of information. This is, of course, a speculation that needs serious development. As for the empirical source of our research, the data that we use as the empirical base for this article are taken from two sources: more than 2.600 nominalizations taken from LexEsp, an annotated corpus from the *Universitat Politecnica de Catalunya* and the nominalizations contained on two electronic dictionaries of contemporary Spanish (*Diccionario de la Real Academia* and *María Moliner*).

[4] During this article we will illustrate the (a)telicity of an even using as a test compatibility with *durante* (*for*) or *en* (*in*) phrases as a test to diagnose (a)telicity. Other tests that diagnose (a)telicity, such as compatibility or not with phase verbs such as *stop* (*John stopped eating soup* vs. **John stopped eating a cake*) give the same results as the other test in Spanish: there is a contrast between *Juan dejó de comer sopa* and **Juan dejó de comer un pastel*, which is ungrammatical unless it is interpreted as a frequentative event (*to eat a cake every day*). Due to space limitations, we will not present these others tests, but it is worth mentioning that their result is identical as the *durante*/*en* phrase test.

(3) a. *Juan comió sopa {durante/*en} media hora.*
Juan ate.3SG.PAST soup {for/in} half an hour.
b. *Juan comió un pastel {*durante/en} media hora.*
Juan ate.3SG.PAST a cake {for/in} half an hour.

Thus, we conclude that *comer* selects a rheme path object as its internal argument. Notice at this point that the nominalization of this verb is derived using the affix *-do/-da*: *comida.*

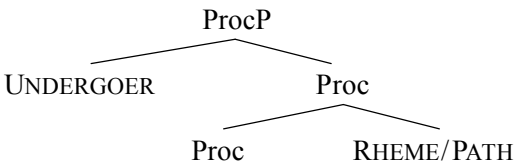
The second relevant class of internal arguments are undergoers. An undergoer is defined as the entity that experiences a process, but which does not delimit the extension of that process; therefore, they do not co-describe the event and by the same logic they do not intervene in the aspectual properties of the predicate. An example of a verb that selects an undergoer is the verb *desplazar*, 'to move'. It does not matter for the aspectual properties of this verb whether the internal argument is a mass noun (4a) or a count noun (4b): in both cases, the arguments are compatible with an atelic reading of the predicate.

(4) a. *Juan desplazó arena durante cinco minutos.*
Juan moved.3SG.PAST sand for five minutes.
b. *Juan desplazó una silla durante cinco minutos.*
Juan moved.3SG.PAST a chair for five minutes.

It is interesting to notice that the nominalization from this verb is done with the affix *-miento*: *desplazamiento*

The distinction between these two classes of internal arguments is well-known, but Ramchand (2008) goes one step further and proposes that each class occupies a different position inside the verbal structure. Rheme Paths, and semantic paths in general – independently of whether they are materialized as nouns, adjectives or prepositions – are merged as complements of Proc, the designated head to host process meanings. Undergoers are specifiers of this same category (5).

(5)



In section 2.1. we provide evidence that *-miento* requires the verb to have an undergoer and *-do/-da* requires the verb to have a rheme path. One con-

sequence of this analysis is that a verb that has both an undergoer and a rheme path will be compatible, under different readings, with both affixes, and this will be shown in section 2.2.

2.1. The distribution of *-miento* vs. the past participle *-do/-da*

A first straightforward piece of evidence comes from the class of verbs of change of state. Changes of state can be associated to scales that measure the change, and, to the extent that scales are ordered series of points that can be bounded or unbounded, scales are paths. Then, depending on whether this path is projected as an internal argument or as part of the meaning of the verbal base, we expect a different behavior of these bases with respect to nominalizations. The prediction is, as we will see, borne out.

Let us consider first some change of state verbs in which the change is measured with respect to a property of the internal argument, and therefore, select incremental themes. The data in (6), (7) and (8) illustrate that these verbs are nominalized with the affix *-do/-da*, never *-miento*.

(6) a. *Juan peló fruta {durante/*en} cinco minutos.*
Juan peeled.3SG fruit {for/in} five minutes.
b. *Juan peló una manzana {*durante/en} cinco minutos.*
Juan peeled an apple {for/in} five minutes.
c. *pela-do* (not **pela-miento*).

(7) a. *Juan bronceó oro {durante/*en} cinco minutos.*
Juan bronced.3SG gold {for/in} five minutes.
b. *Juan bronceó un reloj {*durante/en} cinco minutos.*
Juan bronced.3SG a watch {for/in} five minutes.
c. *broncea-do* (not **broncea-miento*).

(8) a. *Juan bordó tela {durante/*en} una hora.*
Juan sewed.3SG fabric {for/in} one hour.
b. *Juan bordó una camisa {*durante/en} una hora.*
Juan sewed.3SG a shirt {for/in} one hour.
c. *borda-do* (not **borda-miento*).

Other verbs belonging to this class are *barnizar*, 'to barnish', *esquilar*, 'to cut the hair', *pintar*, 'to paint', *sembrar*, 'to seed', whose nominalizations are, as we expected, *barniza-do, esquila-do, pinta-do* and *sembra-do*.

When the change of state verb does not select a rheme path object, the nominalization requires *-miento* and it is ungrammatical with *-do*. This is the case with verbs such as *destripar*, 'to slaughter', whose nominalization is *destripamiento*, *ocultar*, 'to hide', which makes *ocultamiento*, or *recibir*, 'to receive', which makes *recibimiento*. The *durante/en* phrase test shows that the referential nature of the object does not influence the verb's aspectual properties.

(9) a. *Juan destripa {poesía/un poema} en cinco minutos.*
Juan slaughters {poetry/a poem} in five minutes.
b. *Juan ocultó oro/a un fugitivo durante un mes.*
Juan hide.3sg.past gold/acc a fugitive for one month
c. *Juan recibió {oro/un premio} {*durante/en} cinco minutos.*
Juan received.3sg {gold/a prize} {for/in} five minutes.

Other verbs belonging to this class are *procesar*, 'to process', *someter*, 'to subjugate' or *silenciar*, 'to silence'. Their nominalizations are *procesamiento, someti-miento* and *silencia-miento* (never **procesa-do, *someti-do, *silencia-do*).

The well-known class of degree achievement verbs is famous because the scale that is used to evaluate a change of state is expressed by the verbal base, sometimes in the form of an adjective present in its morphological structure. Therefore, the internal argument will be projected as an undergoer and not as a path, for the path is already expressed by the verbal base. Therefore, our prediction is that all degree achievement verbs will reject nominalizations with *-do/-da* and will use *-miento*. This prediction is borne out, as shown in the series of (10).[5]

[5] It can be argued that the adjective which denotes the scale used as path will be in the position of Rheme Object (complement of Proc°) and, therefore, will not leave place for insertion of *-miento*. This is a fair objection, but there is a solution for it. Notice that in Spanish – and also French and Italian – most degree achievements contain a 'prefix' which corresponds to a preposition – most frequently, *en* and *a-*, as in *en-fri-a(r)*, 'to cool down'. I suggest that the presence of this prefix is not trivial for syntax and that it introduces in the Rheme Path position a relational structure in whose specifier *-miento* is merged (as in *en-fri-a-miento*, 'cooling down', [$_{\text{ProcP}}$ -a- [$_{\text{PP}}$ -miento [$_{\text{P°}}$ en- [$_{\text{AP}}$ frio]]]]).

(10) a. *enfriar*, 'to cool', *calentar*, 'to heat', *empobrecer*, 'to impoverish', *alargar*, 'to lengthen', *endurecer*, 'to harden', *ensanchar*, 'to widen', *engrosar*, 'to fatten'…

b. *enfria-miento, calenta-miento, empobreci-miento, alarga-miento, endureci-miento, ensancha-miento, engrosa-miento*.[6]

We have yet another further prediction in the general class of change of state verbs. Undergoers are defined as entities that experience a process, and the concept of experiencer is tightly associated to psychological verbs. Therefore, we expect all psychological verbs to reject nominalizations with *-do*/*-da*, for their lexical meaning makes them select undergoers and not rheme path objects. The prediction, again, is confirmed; all the verbs in (11) make nominalizations with *-miento* and *-do* nominalizations are sharply ungrammatical.

(11) a. *sentir*, 'feel', *pensar*, 'to think', *descubrir*, 'to discover', *reconocer*, 'to reckon', *entender*, 'to understand', *presentir*, 'to present', *aburrir*, 'to get bored', *convencer*, 'to convince', *enamorar*, 'to fall in love', *relajar*, 'to relax'.

b. *senti-miento, pensa-miento, descubri-miento, reconoci-miento, entendi-miento, presenti-miento, aburri-miento, convenci-miento, enamora-miento, relaja-miento*.

Let us consider now the general class of verbs of motion. Two are the subclasses which are relevant to test our proposal: verbs of inherent direction, whose semantics force them to introduce a path, and verbs of induced movement, which denote that movement was caused on an object. In this second case, the object that suffers the change of position is an undergoer,

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[6] It is perhaps worth mentioning that the behavior of degree achievement verbs with respect to event nominalizations casts doubt on an account of affix rivalry that states that the choice of the affix depends or is primed by its frequent co-occurrence with another affix, which may even select it idiosyncratically. Notice that many of the degree achievement verbs contain the verbal affix *-ece-*; it could be claimed, thus, that *-miento* is chosen in this class because the presence of *-ece-* primes or selects -miento. This position is, however, untenable because some degree achievement verbs, such as *calentar*, 'to heat', do not contain the affix *-ece-* and, still, require *-miento* as a nominalizer. Also, non degree achievement verbs such as *par-ece-r*, 'to resemble', constructed from *par*, 'pair', contain *-ece-*, but the nominalization cannot use *-miento*.

and the path, if any, is expressed in the form of a prepositional phrase. Induced movement verbs are shown to nominalize with *-miento* in (12).

(12) a. *desplazar*, 'to displace', *mover*, 'to move', *asentar*, 'to settle', *deslizar*, 'to make something slide', *lanzar*, 'to throw', *posicionar*, 'to position', *acercar* 'to approach.
b. *desplaza-miento, movi-miento, asenta-miento, desliza-miento, lanza-miento, posiciona-miento, acerca-miento*.

The fact that their internal argument is an undergoer can be independently tested by the fact that the aspectual properties of the predicate do not depend on the mass/count nature of that object.

(13) a. *Juan lanzó {harina/una silla} en un minuto*.
Juan threw.3SG {flour/a chair} in a minute.
b. *Juan acercó {agua/una sardina} al fuego en un segundo*.
Juan approached.3SG {water/a sardine} to the fire in a second.

Forms such as **lanza-do* or **acerca-do*, where the nominalization uses the affix *-do/-da*, are felt as ungrammatical and are unattested in corpora. This contrasts with the verbs of inherent direction, whose nominalization is constructed with *-do/-da*.

(14) a. *llegar*, 'arrive', *ir*, 'go', *venir*, 'come', *caer*, 'fall', *entrar*, 'come in', *salir*, 'come out'…
b. *llega-da, i-da, veni-da, caí-da, entra-da, sali-da*

Forms such as **llega-miento*, **i-miento* or **entra-miento* are ungrammatical: the verbs require the affix *-do/-da* for their nominalizations. The meaning of this verbs is defined with respect to the properties of the path (e.g., *fall* implies a path oriented downwards in the vertical axis), and, therefore, they need to have a path in their argument structure.

Let us explore another prediction of the proposal. Path objects necessarily require the existence of an action which can be tracked, so we predict that verbs which denote a static relationship between entities will select an undergoer. Consequently, we expect these verbs to reject nominalizations with *-do/-da* and use *-miento*. This prediction is, once more, confirmed. A verb such as *mantener*, 'to hold', which defines a static relationship between the direct object and a location, requires *-miento* (*manteni-miento*, not **manteni-do*). (15) shows that the internal argument is an undergoer.

(15) *Mantuvo {arroz/un lápiz} en la mano {durante/*en} un minuto.*
He kept.3SG {rice/a pencil} in his hand {for/in} one minutes.

Other similar verbs are *acompañar*, 'to go with', *enfrentar*, 'to oppose', *acatar*, 'to accept' and *solapar*, 'to overlap', whose nominalizations are, as expected, *acompaña-miento, enfrenta-miento, acata-miento* and *solapa-miento*.

We conclude, therefore, that *-do*/*-da* and *-miento* are both sensitive to the argument structure of the verb they nominalize, because their distribution can be accounted for by the type of internal argument selected by the verb.

2.2. Explaining some minimal pairs

As we have shown in the previous section, *-miento* nominalizations require an undergoer and past participle nominalizations in *-do* and *-da* require a path. This opens the door to a situation where a verb that has both components may have two nominalizations, one with each affix, depending on which one of the two components is taken as more salient. This prediction is borne out. Consider the verb *crecer*, 'to grow'. This verb contains both a path, in the form of a scale, and an undergoer that suffers the change of state process.

(16) a. *creci-miento*, 'growth'
b. *creci-da*, 'overflowing'

The nominalization with *-miento* is related to the verb *crecer* as a change of state where, for example, a child gets incrementally older or taller; in this sense, this is a normal change of state verb associated to a scale. In contrast, *crecida* derives from a very specific use of the verb where it is used to describe an inherently directional verb. *Crecida* specifically denotes an event in which a river, as a result of the heavy rains, has overflowed. This second reading implies a change of location of the river, which moves in the vertical axis, crossing the spatial boundary marked by its banks. Therefore, the two nominalizations fall under the general patterns described in the previous section.

Let us consider another example, the case of the verb *recoger(se)*, 'to put something back together' (17).

(17) a. *recogi-miento*, 'calming down'
b. *recogida*, 'collecting'

The existence of these two nominalizations is motivated by two possible senses of the verb *recoger(se)*. In the first sense, illustrated in (18a), the verb is an activity verb that takes an incremental theme, the set of things that are put together. The equivalent nominalization is (17b), as seen in (18b). In the second sense, close to English 'to put oneself back together', the verb denotes a psychological state (18c), and the equivalent nominalizations is (17a).

(18) a. *Juan recogió las firmas*.
Juan collected.3SG the signatures.
b. *La recogi-da de firmas (por parte de Juan)*.
The collect-ing of signatures (by Juan).
c. *Juan se recogió tras el incidente*.
Juan himself put-back-together.3SG after the incident.
d. *El recogimiento de Juan tras el incidente*.
The collect-ing of Juan after the incident.

Notice, incidentally, that the fact that the same base, under closely related meanings, requires two different affixes challenges a view where affixes are idiosyncratically selected by verbal bases: such approach would be force, to our mind, to propose that each nominalization corresponds to a different verbal base, ignoring the close semantic relationship between them.

Let us consider a final example, the case of the verb *alzar(se)*, 'raise'.

(19) a. *alzamiento*, 'upraising'
b. *alzado*, 'raising'

As in the previous case, the reason for this alternation is due to the different argument structure patterns that the verb *alzar(se)* is licensed with. The verb can be understood as an inherent direction verb that describes a movement in the vertical axis, as in (20a), and that kind of event requires the nominalization in (20b), with the past participle. However, the verb also allows a meaning in which it is described that someone opposes a particular situation, such as, for example, when the army rises up against the government (20c). In this second sense, the verb denotes a static relationship between two entities, the army and the statu quo, and therefore requires the nominalization with *-miento* (20d).

(20) a. *El soldado alzó la bandera*.
The soldier raised.3SG the flag.

b. *El alza-do de la bandera*.
The rais-ing of the flag.
c. *El ejercito se alzó*.
The army SE raised.SG, 'The army rose up'.
d. *El alza-miento del ejército*.
The rais-ing of-the army, 'The uprising of the army'.

The explanation that we have proposed for the distribution of *-miento* and the past participle in Spanish event nominalizations fares well in accounting for these alternations. It is not clear, to our mind, how an alternative explanation in terms of analogy or parsing could capture these patterns.

3. The properties of *-ción* event nominalizations

The behavior of *-ción* contrasts with the one displayed by the two affixes we just presented in the sense that it is not sensitive to the argument structure of the verb. This property patterns, as we will suggest, with other special characteristics of this affix and the nominalizations that it builds.

The affix *-ción* can nominalize a verb that selects an undergoer, such as *elegir*, 'to choose', whose nominalization is *elec-ción*. (21) shows that the referential properties of the internal argument do not change the aspect of this verb.

(21) *Juan eligió* {*oro*/*un coche*} {**durante*/*en*} *un segundo*.
Juan chose.3SG {gold/a car} {for/in} a second

However, the same affix can be used with verbs that select a rheme path object, such as *construir*, 'to build' (nom. *construc-ción*), whose internal argument is shown to be an incremental theme in (22).

(22) a. *Juan construyó una casa* {**durante*/*en*} *un segundo*
Juan built.3SG a house {for/in} a second
b. *Juan construyó poesía* {*durante*/**en*} *una hora*
Juan built.3SG poetry {for/in} an hour

This is not the only especial property of this affix. For example, as the reader may have already noticed, *-ción*, unlike *-miento* or the past participle affix, does not require the verb to appear with a theme vowel, which is a property of all verbs in Spanish. There are some minimal pairs in Spanish

in which the same verb has two nominalizations, one with *-miento* and another one with *-ción*; the former always requires the theme vowel, while the latter does not.

(23) a. From *mantener*, 'to maintain'
manuten-ción, manten-i-miento
Verb-ción verb-theme vowel-miento
b. From *recibir*, 'to receive'
recepc-ción, recib-i-miento
verb-ción verb-theme vowel-miento

Other verbs, such as *elegir*, 'to choose' (nom. *elec-ción*), *optar*, 'to aspire' (nom. *op-ción*) or *intervenir*, 'to intervene' (nom. *interven-ción*), illustrate that *-ción* does not need the theme vowel to be present.

In fact, *-ción*, as opposed to the past participle and *-miento*, does not require a verbal base; it also admits smaller units which Distributed Morphology has identified as roots (Marantz 1997). (24) shows that some of the bases with which *-ción* combines cannot be used as verbs.

(24) a. *fun-ción*, 'function', *rela-ción*, 'relation', *reac-ción*, 'reaction'
b. **fun-ar, *rel-ar, *reac-ar*/**reag-ir*

There are no equivalent cases with the participle or with *-miento*: all their formations are constructed on top of verbs with their theme vowels.

These properties may also be related to the fact that some of the nominalizations that use *-ción* cannot be characterized as event or result nouns, but are rather nouns denoting general properties, states, qualities or even physical entities. This is never the case with nominalizations that use either *-miento* or *-do*/*-da*. Other relevant examples are shown in (25).

(25) *colora-ción*, 'color', *posi-ción*, 'position', *direc-ción*, 'address', *tradición*, 'tradition'

A noun such as *na-ción*, 'nation', may be related to the verb *nac-er*, 'to be born', but as a noun it is not its event nominalization. We have not attested comparable cases with *-miento* or the participle *-do*/*-da*, and, to the best of my knowledge, such cases have not been reported in the literature about Spanish.

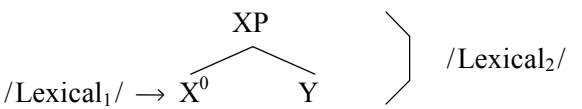
Thus, we have shown that the productive Spanish nominalizer affixes can be classified in two groups, depending on whether they are sensitive to the argument structure of the verb: *-ción*, by far the most productive of

them, is not sensitive, while the distribution of *-miento* and *-do*/*-da* can be explained by the nature of the internal argument of the verb.

4. A syntactic account

In this section we will make a proposal with respect to the syntactic account of these empirical generalizations. Our proposal follows the version of Minimalism argued for in Gärtner (2002), in which the syntactic derivation is related with set theory: each node represents a set consisting of the items that it dominates, if any. In this proposal, lexical insertion can only be restricted to terminal nodes as a stipulation, because both terminal and maximal nodes are representations of the same entity: sets. Therefore, in our proposal we will crucially phrasal spell out, that is, the insertion of lexical material under non-terminal nodes (cfr. Caha 2007; Neeleman and Széndroi 2007; Ramchand 2008). A lexical item, thus, can lexicalize a terminal node ($Lexical_1$ in 26) or a maximal node ($Lexical_2$ in 26), in which case it lexicalizes the constituents contained under that node.

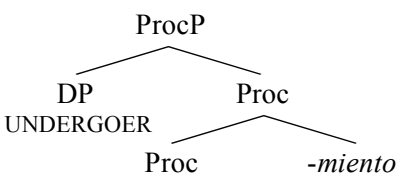
(26)



4.1. The syntactic behavior of *-miento*.

The affix *-miento* requires the presence of a verbal base, that is, it cannot take roots as its base. It is also sensitive to the presence of an undergoer. For this set of reasons, I propose that the position of the affix is the one in (27), where I do not represent yet the features of the affix.

(27)



If the affix *-miento* is introduced first in one of the argument positions of the verb, then we explain that it requires verbs as its morphological base. If the verbal projection that introduces the affix is ProcP, then we explain that

affix is associated to bases that contains an undergoer, for this kind of argument is introduced as the specifier of this syntactic category.

Notice that the affix is occupying in our configuration the complement position of Proc, and, in the framework that we assume in this article, this is the position of the rheme path argument. Therefore, we predict that *-miento* not only requires an undergoer, but is incompatible with a rheme path argument – with the caveat of parasynthetic verbs – for it is occupying the position that such an element requires. This prediction is borne out.

We have seen that incremental theme objects are not out from other kinds of nominalizations. Let us show now that nothing is, in principle, wrong with having locative paths inside nominalizations. The following pair illustrates that the *-do*/*-da* nominalization is compatible with all the arguments: agent, rheme and the optional path.

(28) a. *Las autoridades alumbraron la calle hasta el tercer bloque*.
The authorities illuminated the street to the third block.
b. *El alumbrado de la calle hasta el tercer bloque por las autoridades*.
The illumination of the street up to the third block by the authorities.

The pair in (29) shows that the same situation is true with *-ción* nominalizations: agent, undergoer and path are allowed in the nominalization of (29b).

(29) a. *Las autoridades repatriaron a los inmigrantes a Kenia*.
The authorities repatriated.3PL ACC the immigrants to Kenia.
b. *La repatriación a Kenia de los inmigrantes por las autoridades*.
The repatriation to Kenia of the immigrants by the authorities.

However, this is not true of a *-miento* nominalization. A verb such as *seguir*, 'to follow', allows a path when it is a verb, but the same constituent is ungrammatical in the nominalization (30b).

(30) a. *Siguieron a-l sospechoso a la casa*.
Followed.3PL ACC-the suspect to the house.
b. *El segui-miento del sospechoso (*a la casa)*.
The follow-ing of the suspect (to the house).

The same contrasts take place if the locative path is expressed by a DP. The semantic interpretation of *el río*, 'the river', in (31) is that it is the entity

that defines the path that the subject is following: its meaning is 'to follow the path defined by the river's banks'.

(31) *Seguir el río.*
To follow the river

The verb *seguir* is also interesting because its argument structure includes both a path and an undergoer, and, therefore, some speakers have both a *-miento* and a past participle nominalization from it. As shown in (32a), the *-miento* nominalization is ungrammatical with this DP path, but the past participle nominalization (32b) allows it.

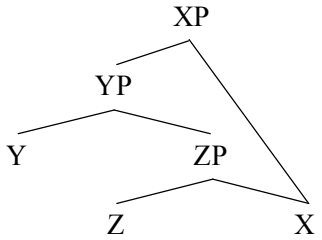
(32) a. **El segui-miento del río*
The following-of-the river.
b. *La segui-da del río*
The following-of-the river.

The incompatibility of *-miento* nominalizations with paths supports the proposed syntactic configuration in (27).[7]

The natural question at this point is how *-miento* can nominalize the structure from this position. Our technical implementation of this process follows Gärtner (2002) in his proposal that syntactic movement can be viewed as remerge of a constituent from a lower projection to the highest node of the configuration. From here it follows that the constituent that 'moves' through remerge is able to project its label to the whole configuration (cfr. also Chomsky 2004 and Starke 2004).

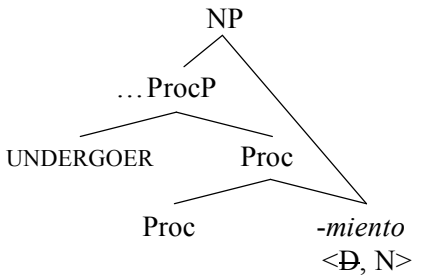
[7] Notice, also, that once that *-miento* is merged as the complement of Proc°, another possible head, of aspectual nature, is prevented from being inserted: Res°. The consequence of this is that the insertion of *-miento* may have some aspectual consequences; more in particular, the fact, noticed by some authors (e.g. Martin this volume), that *-miento* nominalizations seem to be more durative and less punctual than their corresponding verbs. For example, from *sacudir*, 'shake', the nominalization in *-miento*, *sacudimiento*, suggest a procesual view of shaking that does not change the position of the object that shakes, as when a house shakes during an earthquake; *sacudida*, with the participle, apart from allowing some displacement, as when a bull hits a car, is a punctual event. Even though the distribution of these affixes is not motivated by aspect, but by the presence of the path, as we have argued, a particular suffix can indeed have indirect aspectual implications.

(33)



In (33), X is a member which belongs to more than one set: the set XP and the set ZP. This is possible in a system which views syntactic trees as representations of sets of units, such as the one developed in detail in Gärtner (2002: 145–171). X in (33) would correspond to *-miento* in (27), after remerge which brings as a consequence that it nominalizes the structure. The crucial question at this point is what makes it need to remerge. We propose that the set of features lexicalized by *-miento* include a full DP with an additional N feature. In the representation in (27), before remerge, the D feature of *-miento* is already licensed by its being in an argument position, but the N feature cannot be licensed in this context. This is what triggers remerge of *-miento*: the affix needs to remerge in order to project this N feature, with the result that the whole construction is not headed by an NP.

(34)



Once that *-miento* remerges, the structure is nominalized and the projection of its N feature blocks insertion of the projections that normally dominate a verb, such as Aspect and Tense.[8]

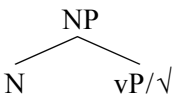
[8] A fair question at this point is why the nominalizations in *-miento* do not denote paths if the affix is merged in the position reserved for paths. Compare this situation with the 'agentive' suffix *-dor*/*-er*, which shares its properties with *-miento*. As shown in Booij and Lieber (2004), this suffix does not always produce nominalizations that denote agents. The nominalizations in *-er* denote many kinds of semantic notions appart from agent (e.g., *six packer, third grader, Lon-*

We suggest that the analysis with remerge is necessary for any affix which has the relevant properties of *-miento*: it cancels an argument, while requiring at the same time the presence of the projection that introduces such argument, and it changes the grammatical category. This set of properties are straightforwardly accounted for by generating such an affix in the position of the argument and remerging it as the highest node of the structure, and, therefore, changing its category label. Some candidates for this class of syntactic objects are the suffixes *-ble*, '-able', *-dor*, '-er' and *-nte*, '-er', so, as we can see, the properties of *-miento* are not idiosyncratic in the grammar of Spanish.[9]

4.2. Position of *-ción*

The properties of the affix *-ción* are those that we expect from a nominalization process where the nominal features are introduced independently from the verbal structure: it is not sensitive to argument structure, it can combine with roots and it is compatible with all the arguments of the verb, because, not being introduced by the verbal structure, it does not occupy any of the argument positions. These properties are explained if *-ción* is the lexical spell out of an NP layer which subordinates the verbal structure, as represented in (35).

(35)



4.3. The syntactic behavior of past participle nominalizations.

Potential problems for a syntactic representation may come from the behavior of *-do*/*-da*, because this affix is sensitive to the argument structure of the verb – it requires rheme path objects – but does not cancel any part of

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doner…). I suggest that a general property of affixes, as opposed to stems, is that their denotation is not determined by their position, maybe due to a defective conceptual semantics. However, this requires further research.

[9] For a specific analysis of the agentive suffix *-dor* in Spanish, following the same proposal presented here, cf. Fábregas 2008. The analysis can also be extended to some cases of compounds in Romance, such as the famous agentive VN type (cf. Scalise, Fábregas & Forza *in press*).

the argument structure of the verb. In this section, we will show that this apparent contradiction is solved by the fact that the nominalizer *-do*/*-da* is identical to the past participle. We will show that this affix is, actually, the participle and the nominal features are introduced by N-embedding. Sensitivity to the argument structure of the verb comes from the fact that the participle requires a functional projection that needs a rheme path object to be licensed.

Let us show first that this affix is the past participle suffix and not just one which happens to be homophonous with it. The evidence comes from irregular participles: in those verbs that allow participal nominalizations, if the past participle is irregular, the nominalization uses the same irregular participal affix than the verb (36).

(36) a. *escribir*, 'to write', *he escri-to*, 'I have written'
Nominalization: *escri-to*

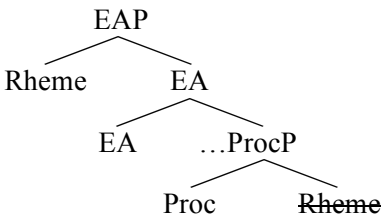
b. *decir*, 'to say', *he di-cho*, 'I have said'
Nominalization: *di-cho*

As the same affix is used when the participle is verbal and when it is a nominalization, it follows that the participial morpheme cannot be responsible for the nominalization: it is necessary to analyse this morpheme as part of the verbal structure, not as the nominalising layer. In other words, *-do*/*-da* cannot be analysed as *-miento*. From here it follows that the nominal features are not introduced in the representation as part of the verbal projection, but, just like in the case of *-ción*, they are inserted as part of an independent NP projection that dominates the verbal structure. This explains why past participle nominalization do not cancel any part of the argument structure of the verb, but does not explain why the affix requires the presence of a rheme path objects. We argue that the answer to this second question depends on the nature of rheme paths.

Rheme paths have a special status on the functional structure of the verb. As we have seen, they influence the external aspect of the verbal predicate, in the sense that their referential properties determine whether the event is telic or atelic. This implies that they interact with the functional projection that determines this aspect of a verbal predicate. Following Borer (1994, 2005) and other authors, I adopt the proposal that there is a specific external aspect projection that defines the (a)telicity of the event by attracting the rheme object; unlike Borer, however, I propose that this projection is present both with telic and atelic events and in both cases it attracts the rheme: none of them can be considered unmarked. To avoid any

conceptual misunderstanding, I will label this projection External Aspect (EA).

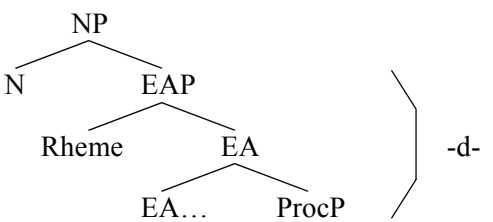
(37)



We propose that the past participle morpheme in Spanish lexicalizes (at least) EAP; notice, however, that as we assume that this projection is present also with atelic events, this implies that the participle is not always perfective (as is indeed the case empirically).[10] If *-d-* requires EAP for insertion, the configuration explains that object rhemes are necessary in nominalizations that use *-do*/*-da*: the participial morpheme does not come from inside the argument structure of the verb, but it is associated with a projection that interacts with path objects. Therefore, we expect this class of nominalizations to require a path object and, also, to require the presence of the verbal structure that introduces this path object.

The nominal layer is merged on top of the verbal structure, as in (38).

(38)



Now the question is what spells out the nominal layer. Clearly, the presence of the gender markings (*-o* or *-a*)[11] which appears in the participle in these

[10] Given *Phrasal Spell Out*, which was already introduced, it could be the case that *-d-* spells out other parts of the structure; hopefully, this could give us a unified account of the syntactic representation of all kinds of participles, but this goal is way beyond the restricted limits of this paper.

[11] We will not analyse the correlations found between the distribution of gender and the mass-count parameter, noticed, among other authors, by Bordelois (1993). We suggest that this correlation takes place at the level where correspondences between gender class and some properties of the semantics of the noun are dealt with, and, therefore, they are not immediately crucial for our analysis.

nominalization is related to the presence of a noun, but this does not mean necessarily that they are responsible for the nominalization; it could be the case that the nominalization is performed by a phonologically empty affix which checks some features with gender (Picallo 2006). In any instance, what is crucial for our proposal is that the nominalization is not performed by the participial morpheme; notice that this cannot be the case unless we want to propose that there are two -or several; remember the irregular participles involved in nominalisations- homophonous morphemes which happen to be both associated to verbs, one of which is a noun and another of which is an aspectual head.

Therefore, the apparent contradiction in the properties of *-do*/*-da* nominalisations is resolved: the nominal features are introduced independently of the verbal structure, but the participial morphology indirectly requires the presence of a path object.

5. The role of morphological blocking

The behavior of *-ción* raises some additional questions about our account. If *-ción* does not care about the argument structure of the verb, one first question is why it is not the case that all verbs have a nominalization in *-ción*. That is, what happens with the words in (39)?

(39) a. *desliza-ción* (vs. *desliza-miento*)
slide-ción, 'sliding'
b. *sangra-ción* (vs. *sangra-do*)
bleed-ción, 'bleeding'

Notice that we have avoided assigning stars to the *-ción* forms in (46). The reason will be clear in a moment. There is also a second related question: why cannot the suffixes *-ción* and *-do*/*-da* take over a nominalization in *-ción*, when the base fits their requisites? What happens with the forms in (40)?

(40) a. *preocupa-miento* (vs. *preocupa-ción*).
worry-miento, 'worrying'
b. *destrui-do* (vs. *destruc-ción*)
destroy-ed, 'destruction'.

Our proposal is that these words are not attested and they are not always accepted by speaker because of morphological blocking: once that we have

already a nominalization in *-miento*, *-ción* or the past participle, the speaker refrains from constructing another word with a different affix, unless there is an independent motivation. The independent motivation, then, can be used to test our proposal.

The first prediction is that speakers may have doubts with respect to whether a certain word exists and, then, they may try to make a new word. The result could be one in which eventually two forms are attested, one with *-ción* and another one either with the participle or *-miento*. This is, for example, what happens with the verb *cicatrizar*, 'to scarify', which has two nominalisations attested in the Real Academia dictionary, *cicatriza-miento* and *cicatriza-ción*.

Also, a word like *preocupamiento* is attested in informal texts. Google registered 132 hits of this word (14-05-2008), and *destruido* as an event noun is also attested in the same kind of text (*El malestar de los menores extranjeros empuja a hechos como el destruido de Arzentales*, 'The uneasiness of the underage foreigners causes events such as the destruction of Arzentales').

The second clear prediction is that, actually, both words will also appear if in some domain of reality they develop different meanings. In fact, the word *deslización* appears 84 times in google, always in texts about physics, science where it has a specialized meaning that has to do with the ability of a certain substance to help objects to slide. The word *sangración* is also attested (47 hits) with the particular meaning of the spontaneous bleeding believed to be, in some religions, a sign of the sanctity of a person.

6. Concluding remarks

In this article we have argued that what could seem as a case of idiosyncratic distribution of affixes is actually a pattern which can be explained based on syntactic and semantic properties of the base.

An interesting consequence of this approach is that, in the course of this discussion, we have identified two different ways to introduce the nominal features in a nominalisation:

(41) a. N- feature "recycling"
Nominal features in one of the argument positions of the verbal domain remerge on top of the verbal structure (cfr. *-miento*).

b. N-feature embedding
Nominal features come from a nominal head under which the (verbal) structure embeds (cfr. *-ción* and the past participle nouns).

These two processes imply different empirical properties: remerge requires a configuration where one of the argument positions is occupied, so we expect that one of the arguments of the verbal predicate gets lost in the nominalization. We also expect that this type of nominalization is dependent on the existence of verbal structure, and a specific type of it.

As for the subordination strategy, the main property is that it can co-occur with all the arguments of the predicate, because the nominal features are not introduced in an argument position. This does not imply that it will always co-occur with all the arguments: this may depend on the different heights where the subordination can take place (Alexiadou 2009; Harley 2009). Depending on whether the affix lexicalizes part of the verbal structure or not, we can differentiate between two different kinds of affixes associated to the subordination strategy. If the affix just lexicalizes the nominal features, we expect it to be able to combine with any kind of verbal predicate – maybe, also, non verbal structures, like roots –, as was the case with *-ción*. As far as we know, another good candidate for this kind of affix would be *-ing* nominalizations in English.

However, if the affix lexicalizes part of the verbal projections in addition to the nominal features, we expect that it will be dependent on the presence of a specific type of verbal structure – at least to the extent that the projections that it lexicalizes depend on the category that we call 'verb'. This was the case of the affix *-do* and its feminine counterpart *-da*. Infinitival nominalizations in Spanish, which are dependent on the type of predicate (Fábregas and Varela 2006), are, in our opinion, a good candidate for this kind of affix.

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The syntax of deverbal nominals in Bulgarian

Angelina Markova

1. Introduction

The goal of this paper is to provide a syntactic analysis of deverbal nominals in Bulgarian. My starting point is the assumption that word formation is syntactic and functional and that a categoriless root is spelled out as a noun, adjective, or verb, depending on the functional layers that dominate it (Alexiadou 2001). Contrary to Alexiadou (2001) and in accordance with Ferrari (2005), I will show that sometimes a stem and not a root must be inserted in syntax.[1]

Another important assumption adopted in this work is Grimshaw's (1990) claim that without event structure there is no argument structure and that nominals can be divided into complex event, simple event and result nouns. I will show that such a classification is also supported by data from Bulgarian.

A crucial factor for the derivation of nominals is the status of nominalizers within the nominalizing process. Following Ferrari (2005) I will defend the obligatory presence of such nominalizing heads and claim that in Bulgarian they can appear in the form of gender suffixes or various derivational suffixes marked for gender. Thus, I will suggest that noun formation results from the merger of a nominalizing head nº with an XP where XP can be a categoriless root (√P) or a verbal stem (VP), AspP, or VoiceP. It will also be shown that nouns differ depending on the functional layers they contain and on the feature specification of these layers, as suggested in Alexiadou (2001).

The paper is structured as follows: in section 2 I present the general characteristics of nominalizations in Bulgarian after which a syntactic analysis of these nouns follows (§ 3). Section 4 then offers some details on argument structure whereas in section 5 I present a syntactic analysis of prefixation. Finally, section 6 summarizes the main findings of the study.

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[1] I use the term "stem" to refer to a category-marked base in contrast to "root", which is category neutral; the term "verbal stem" is used here to refer to a lexically derived complex Vº head. It should also be noted that although the paper uses some Distributed Morphology (DM) vocabulary, the present account is not in the DM spirit as recourse to processes in a pre-syntactic lexicon is often made.

2. Nominalization types in Bulgarian

Nominalizations are derived via suffixation in Bulgarian. Morphologically, we can distinguish between three types: -NE, Voice -IE and "other-suffix" nouns. I start the discussion with the first group.

2.1. -NE nominals

These nouns derive exclusively from imperfective verbal bases. Following Pashov (1999: 210) I assume that the suffix -NE attaches directly to the imperfect tense base of the verb, i.e. to the base used to form the (past) imperfect tense. This base is obtained by removing the 1st person singular ending *-H* of the (past) imperfect verbal form (see (1a′), (1b′), and (1c′)).[2]

(1)	a. 1st conjugation:	b. 2nd conjugation:	c. 3rd conjugation:[3]
	pe-e-NE	*uch-e-NE*	*kritik-uva-NE*
	sing-E.TH.VOW-NE	study-E.TH.VOW-NE	criticize-IMPF-NE
	'singing'	'studying'	'criticizing'
	a′. base:	b′. base:	c′. base:
	[*pe-E*]-*H*	[*uch-E*]-*H*	[*kritik-uva*]-*H*
	[sing]IMPF-1PS.SG	[study]IMPF-1PS.SG	[criticize]IMPF-1PS.SG
	'I was singing'	'I was studying'	'I was criticizing'

There is an agreement among Bulgarian linguists that -NE nouns are always process-denoting (Pashov 1999; Georgiev 1999). However, there is more diversity than is generally acknowledged in this type of nominalization. Hence, I propose that -NE nominals be divided in two major groups:

(2) a. Gerundive constructions
b. Derived nominal constructions

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[2] The abbreviation IMPF refers to the secondary imperfective suffix *-va* (or one of its allomorphs *-a, -uva,* etc.), and TH.VOW refers to "thematic vowel". The term "imperfect" should not be confused with "imperfective". The former refers to the past imperfect tense base whereas the latter refers to the morphologically imperfective *versus* perfective form of the verb.

[3] There are three conjugations according to the present tense base of the verbs. For further details, see Pashov (1999: 140–144).

In Bulgarian, there is no such form as a "typical" gerund. Nevertheless, bare -NE forms can be used as gerundive-like constructions in this language. Like verbal gerunds, bare -NE constructions take a direct object without any preposition (3a). These constructions do not license a definite determiner and never allow for the article to be attached to them (3b):

(3) a. [*o-chak*]-*va-ne* *velik-a-ta* *promjana*
wait-IMPF-NE great-FEM.SG-the.FEM.SG change.FEM.SG
'awaiting the great change'

b. *[*o-chak*]-*va-ne-to* *velik-a-ta* *promjana*
*wait-IMPF-NE-the.NEUT.SG great-FEM.SG-the.FEM.SG change.FEM.SG
'*the awaiting the great change'

The behavior of the nouns in (3) allows us to suggest that the -NE construction in (3a) behaves in the same way as verbal gerunds in languages like English. These types of constructions should now be compared to those of type (4) below, which are not verbal gerunds but rather true derived nominals. Not only do constructions of type (4) appear with the determiner, but the direct object must also be introduced by the preposition *na* 'of':

(4) [*o-chak*]-*va-ne-to* *(*na*) *velik-a-ta*
wait-IMPF-NE-the.NEUT.SG *(of) great-FEM.SG-the.FEM.SG
promjana
change.FEM.SG
'the waiting for the great change'

Though the process reading is always available in each -NE nominal, there are cases when -NE nouns denote objects as well:[4]

(5) a. *jad-e-ne* b. *smjat-a-ne* c. *sŭm-va-ne*
eat-E.TH.VOW-NE calculate-A.TH.VOW-NE dawn-va.IMPF-NE
'meal/*eating*' 'arithmetic/*calculating*' 'dawn/*dawning*'

[4] We find this in English too where the noun "building" can be either a process or a result nominal. In the case of Bulgarian, the result denotation of -NE nouns can be explained historically. Gradinarova (1999) claims that the -NE suffix entered Bulgarian in the nineteenth century when the -(N)IE suffix was still very productive. In the twentieth century, however, the -(N)IE suffix ceased to be productive. Thus, when a new result noun was derived, the suffix that served this function was either -NE or some of the "other-suffix" nominalizers. However, -NE always preserved its traditional process denotation (marked in italics in (5)), though on occasion it could develop a secondary result meaning.

Having briefly described the first nominalization type, I now proceed to offer some details on the second type, i.e. the Voice -IE nominals.

2.2. Voice -IE nominals

These nouns can be formed from both finite and non-finite forms of the verb. In contrast to the process -NE nominals, they denote some object or abstract concept (Pashov 1999: 213). Thus, whereas *sŭbira*-NE 'collecting' denotes an action (6a), *sŭbran*-IE 'assembly' denotes an abstract concept (6b):

(6) a. s*ŭbir-a-NE*
collect-A.IMPF-NE
'collecting'

b. *sŭbr-a-n-IE*
collect-A.TH.VOW-N.PASS.PRT-IE
'meeting, assembly'

Traditionally, these nouns are known as -NIE nominals where it is believed that the nominalizing suffix -NIE of *sŭbra*-NIE 'assembly' in (6b) attaches directly to the Aorist base of the verb.[5] However, I claim that these nominalizations are formed from past passive participial verbal bases. In my analysis, the nominalizer is the -IE suffix whereas the -N consonant is the passive participial morpheme (i.e. we have *sŭbra*-N-IE 'assembly' and not *sŭbra*-NIE) as in (6b). Regarding such nouns as past passive participial derivatives further explains the fact that these nominalizations can de formed from both perfective and imperfective verbal bases.[6]

Past passive participles in Bulgarian are formed by adding either a -T suffix (7) or an -N (8) one to the Aorist base of the verb.

(7) a. p*ija* > *pi-h* > *pi* > *pi-t*
drink > drink-1PS.SG.AOR > drink.AOR > drink-T.PASS.PRT
'drink' > '(I) drank' > Aorist base > 'drunk'

b. *pi -t -ie*
drink-T.PASS.PRT-IE.NEUT.SG
'a drink'

---

[5] The Aorist base and present tense base are the two basic temporal verbal bases in Bulgarian. The Aorist base is obtained by removing the 1st PS.SG ending -*H* from the Aorist verbal form (e.g. 1st conjugation *pisa-H* 'I wrote', Aorist base: *pisa*), and is used to derive the Aorist participle and past passive participle.

[6] Passive participles (abbreviated here as PASS.PRT) can be formed from both perfective (i) and imperfective (ii) verbal bases in Bulgarian: (i) *prodade-n* (PF) 'sold, which is sold' vs. (ii) *prod-ava-n* (IMPF) 'sold, which is being sold'.

(8) a. *pisha* > *pisa-h* > *pisa* > *pisa-n*
write > write-1PS.SG.AOR > write.AOR > write-N.PASS.PRT
'write' > '(I) wrote' > Aorist base > 'written'

b. *pis -a -n -ie*
write-A.TH.VOW-N.PASS.PRT-IE
'a writing/a written thing'

When a nominal is derived from a -T participial base, we observe that the -T suffix is preserved, as in (7b). If the participle is formed by an -N suffix then the nominalization takes -N, as in (8b), which again supports the claim that these nouns do in fact derive from participial verbal bases.[7]

Additional support for such a claim is provided by the interpretation of these nouns. The past passive participle is used to express the result that the action has on the object (Pashov 1999: 205). In the nominalization process this idea is preserved in that a participial -IE nominalization such as '*pis-a-n-ie'* (8b) means 'writing, the thing that has been written'.[8]

Finally, the following section offers my analysis of the third nominalization type, i.e. the "other-suffix" nominals.

2.3. "Other-suffix" nominals

Under this label I include gender-derived nominalizations (9) and deverbal nouns derived by various suffixes (-(Ž)BA, -ITBA, -KA, -EŽ, etc.) as in (10).

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[7] Some authors claim that -NE and -(N)IE nouns were derivationally related. Pashov (1999: 210), for example, states that at previous stages of their development -NE nominals, like -(N)IE nouns, were derived from the Aorist base of the verb. From a contemporary perspective, however, he considers -NE nouns to be derived from the imperfect verbal base.

[8] There is a small group of event-denoting -IE nouns (e.g. *gonenie* 'persecution'), but they have an exceptional character. We can account for this fact historically. The process denoting -NE suffix appears in Bulgarian later than -(N)IE (see fn. 4). This leads us to suspect that at former stages, when only -(N)IE nominals existed, both processes and results could be denoted by them, as the unambiguously process -NE nouns were still lacking. In fact, this situation holds for Macedonian, where there are only -(N)IE nouns, which can denote both results and processes. That is, eventive -IE nouns are those which have preserved their double interpretation from previous stages of development before the -NE nouns entered the language.

(9)	a. Masculine	b. Feminine	c. Neuter
	[RAZ-*kaz*]-*Ø*	[ZA-*shtit*]-*a*	*tegl-o*
	narrate-Ø.MASC.SG	defend-A.FEM.SG	weigh-O.NEUT.SG
	'narration, story'	'defense'	'weight'
(10)	a. Feminine	b. Masculine	c. Neuter
	kraž –BA	*plam-ŭK*	*dejstv-IE*
	steal-BA.FEM.SG	flame-ŬK.MASC.SG	act-IE.NEUT.SG
	'theft'	'flame'	'action'

Like all nouns, nominalizations are marked for gender. In fact, from the examples in (9) we see that gender nominalizations result from the merger of a gender marker (overt '*a*' for feminine, overt '*-o*/*-e*' for neuter, and covert 'Ø' for masculine) with a root (9c) or a verbal stem as in (9a) and (9b). As for the "other-suffix" nominals, the gender is carried by the suffix.[9]

A comment is in order here. I claim that nominalizations can be formed from either a root √ or a verbal stem (indicated by square brackets in (9)). In cases where there is a (lexical) prefix, we have a stem as in (9a) and (9b). Otherwise, we have a root (9c). The reason for this is the common claim among Bulgarian linguists that prefixation is a verb-formation device whereby the presence of a prefix signals the underlying presence of a verbal stem. As Georgiev (1999: 204) suggests, a prefix in the verbal base is an indicator for its derivational relation to another verb. I use the label √P for roots and VP for verbal stems in the representations that follow.

Among "other-suffix" nominalizations there are some whose suffix absorbs a semantic participant of the verb or an adjunct of the verbal base, a phenomenon which also occurs with the Catalan suffixes -(D)OR/-ER/-AIRE. In (11a) and (11b) we have the Bulgarian examples of such suffixes whereas (11a′) and (11b′) present the analogous Catalan forms (Markova 2007: 32):[10]

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[9] The suffixes that end in -A are feminine, those that end in a consonant are masculine, and those that end in -E are neuter.

[10] As far as the semantics of these nouns is concerned, they may be divided in Agents (e.g. *bor*-ETS 'fight-er'), Patients (e.g. *plenn*-IK 'captive'), Instruments (e.g. *brŭsn*-ACH 'razor'), Objects (e.g. *hran*-A 'food'), Substances (e.g. *gor*-IVO 'fuel'), Actions (e.g. *proda*-ŽBA 'sale'), Places (e.g. *chaka*-LNJA 'waiting room'), etc. (see Markova 2007: 30–32). As an anonymous reviewer observes, all of the above concepts classified with thematic labels are objects from the point of view of the cross-classifying ontological categorization.

(11) a. *pisa-tel*
write-TEL.AGENT
'writer'

b. *zakusva-lnja*
breakfast-LNJA
'place where one breakfasts'

a′. *escript-or* (Agentive value)
write-OR.AGENT
'writer'

b′. *abeura-dor* (Locative value)
drink-DOR
'place where one drinks'

Table 1 offers a brief summary of the three nominalization types in Bulgarian.

Table 1. Deverbal nouns in Bulgarian: General characteristics

Details	*-NE nouns*	*-IE nouns*	"*other-suffix*" *nouns*
Base	Imperfect tense	Aorist, passive PRT	root or verbal stem/VP
General denotation	process	result (abstract)	objects (results)
Aspectual forms	IMPF only	both PF/IMPF	both PF/IMPF

Having briefly commented on the general characteristics of deverbal nominals in Bulgarian, I now devote the following section to my syntactic analysis of these nouns.

3. The syntax of Bulgarian nominalizations

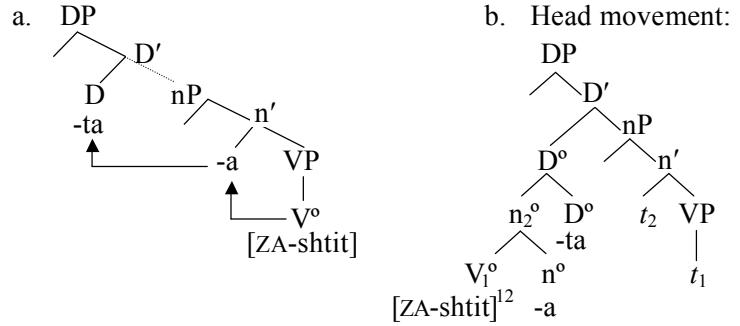
The aim of this section is to provide a syntactic analysis of the three nominalization types exemplified above.[11] I start the discussion with the "other-suffix" nominals.

3.1. The syntax of "other-suffix" nominals

Recall that this group includes gender-derived nouns (9) and nouns derived via various suffixes (10). In the case of gender-derived nouns, I claim that the nominalizing head is the gender morpheme, as diagrammed below:

[11] Due to the limited scope of the present paper, I will not deal with the derivation of adjectives and other nominal modifiers here. It is generally assumed that adjectives either are adjuncts or merge in functional specifiers as in Cinque (1994). Alternatively, they can also be treated as heads that take nominal NP complements (Abney 1987). Be this as it may, adjectives must necessarily be inserted above nP. The reader is referred to Giusti (1996) and references therein for details on the various nominal modifiers in Bulgarian and their possible syntactic derivation.

(12) [ZA-*shtit*]-*a*-*ta* 'the defense' (see (9b)):



The representation in (12) shows that gender nominals are formed by merging a gender marker with a verbal stem VP (in cases where there is a prefix, or, alternatively, a root phrase √P). I claim that it is the gender marker itself that nominalizes √P/VP. The syntactic mechanism used to derive the correct sequence of suffixes in the current study is head movement. Thus, the correct sequence of morphemes is obtained by moving the complex V head [$_{V^o}$ZA-shtit] to nº, which results in the nominalization of this verbal base. The [$_{n^o}$nº+Vº] complex head then incorporates into Dº by head movement and, as a consequence, the definite article is finally attached to it (see (12b)).

The same procedure as the one described for (12) holds for "other-suffix" nominals with the only difference being that the nominalizer is now the suffix already inflected for gender, and not just the gender morpheme.

It should be noted that the current paper shares the intuition behind Baker's (1985) "Mirror Principle" according to which morphological derivations must directly reflect syntactic derivations (and vice versa).[13] However, Baker (1985) does not specify the principles which lie behind the order in which affixes are merged in syntax. To account for this, I follow Cinque (1999) and assume that there is a fixed universal hierarchy of functional projections as part of Universal Grammar according to which affixes are merged in syntax in order to check their features (see (29)).

So far we have seen that the gender nouns and the majority of the "other-suffix" nouns denote objects, abstract concepts, results of actions, etc. (see fn. 10). This can easily be accounted for by the fact that the nominalizing head nº merges directly with the root or previously verbalized stem as in

[12] For the time being, I will not discuss the derivation of complex V heads such as [ZA-shtit] in (12). See section 5.1 for the syntactic derivation of lexical prefixes.

[13] Thanks to an anonymous reviewer for pointing this out to me.

(12), thus not providing any space for other functional projections to intervene and license an eventive denotation.

There are, however, some cases of "other-suffix" nominals, especially those formed by the suffixes -BA, and -ITBA, which can also denote events:[14]

(13) *kraž-ba-ta* *stana* *v 3 chasa*
steal-BA-the.FEM.SG took place at 3 o'clock
'The theft took place at three o'clock'

One way to account for the eventive reading of such nouns is to suggest that it is the nominalizing suffix -BA that brings about eventivity (see Georgiev 1999). However, we have evidence to claim that it is the presence of a verbal thematic vowel which is responsible for this, rather than some property of the suffix.[15] To see how this may be so, consider the noun in (13). The root of this noun is √KRAD and not √KRAŽ. The final consonant of the root [D] is palatalized to [Ž]. To account for this I follow Svenonius (2004a: 180) who claims that consonant mutation consists of palatalization of the final consonant of the root before certain suffixes. It has been argued that consonant mutation in the root implies the underlying presence of a vowel, which is deleted on the surface. We may thus suppose that final consonant palatalization in the nominal *kraž*-BA 'theft' shows that a vowel deletion process has taken place. Following Svenonius (2004a), I suggest that the deleted vowel is the thematic vowel. The root √KRAD is first "verbalized" by a thematic vowel. When the nominalizer -BA attaches to the newly formed verbal stem, i.e. the root plus thematic vowel, the vowel is eliminated and the final [D] of the root softens to [Ž], which indicates vowel reduction. In other words, it is not merely the suffix that brings about the eventive interpretation of these nouns, but the thematic vowel itself.[16]

As for the eventive "other-suffix" -ITBA nominals (e.g. *kos-i-tba* 'mowing', *gon-i-tba* 'chase'), we may reanalyze them as containing a thematic vowel -I and a suffixal element -TBA, respectively. The difference between

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[14] Reichenbach (1947) claims that "happen", "take place", and "occur" can only be predicates of events. Thus, whenever a nominalization appears as the subject argument of these predicates, it is event-denoting in my analysis.

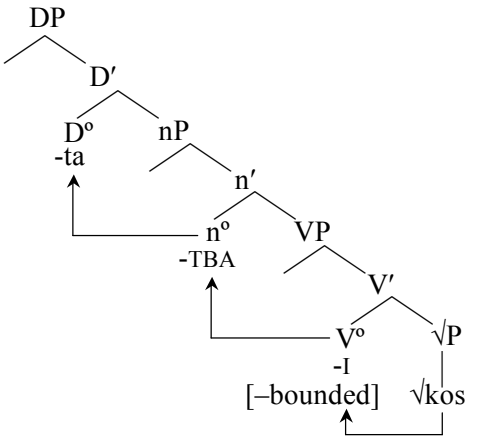
[15] The fact that suffixes cannot bring about eventivity on their own is shown by the fact that there are cases where the same suffix (e.g. -BA) may form result/object nominals (ii) and cases where it yields an event noun (i).
(i) *kraž-BA-ta stana v 3 chasa* (the theft occurred at 3 o'clock)
(ii) **mol-BA-ta stana v 3 chasa* (*the request occurred at 3 o'clock)

[16] For more details on this phenomenon, see Svenonius (2004a).

these nouns and the -BA nominals discussed above is that, in this instance, the thematic vowel is overt (-I) whereas in the former case it is covert. A syntactic derivation follows.

(14) *kos-i-tba-ta* 'the mowing'

a.



b. Head movement

$[_{DP}$ Spec $[_{D^o}$ $[_{n^o3}$ $[_{V^o2}$ $\sqrt{}^o_1$ (*kos*-) + Vº (-*I*-)$]_2$ + nº (-*TBA*-)$]_3$ +Dº (-*ta*)$]$
$[_{nP}$ Spec t_3 $[_{VP}$ Spec t_2 $[_{\sqrt{P}}$ Spec $t_1]]]$

If we compare the representation in (14) with those in (12) above, we can see that there is an additional layer in the derivation of these nouns, the VP projection. I consider V a "verbalizer" that contains the thematic vowel.[17] In this case, the vowel ('-*I*' in (14)) corresponds to the present tense thematic vowel, which is the last element of the present tense base *kos-i* 's/he mows'. Following Stancheva (2003) I propose that this vowel bears the feature [–bounded] which, when merged on a lower verbal head (Vº), assigns an eventive interpretation to the derived noun.[18] Once more, the correct order of suffixes is obtained by head movement (14b).

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[17] The syntactic object V, labelled as "verbalizer" here, is headed by the thematic vowels in my analysis. It should not be confused with the "little *v*". The specifier of "little *v*P" will host the agent/causer argument.

[18] There is agreement among Bulgarian linguists that thematic vowels are aspectual in nature. Pashov (1976: 51–54) suggests that the morpheme which distinguishes between the present, Aorist and imperfect verbal bases is the thematic vowel on which they are built and which, he claims, expresses aspect and (*un*)*boundedness*. Following this view, I suggest that the present tense thematic

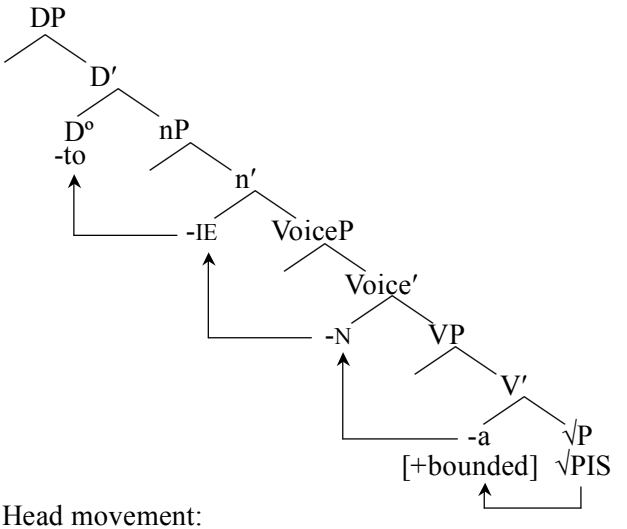
Let us now consider the syntactic derivation of the second nominalization type, i.e. the Voice -IE nominals.

3.2. The syntax of Voice -IE nominals

We have previously seen that these nouns are formed from passive participial verbal bases. A syntactic representation of their derivation is offered in (15).

(15) *pis-a-n-ie-to* 'the written thing, the writing' (see (8b)):

a.



b. Head movement:

$[_{DP}$ Spec $[_{Dº}$ $[_{nº4}$ $[_{VOICE3º}[_{Vº2}$ $\sqrt{º}_1$ (*pis-*) + Vº (*-a-*)$]_2$ + Voiceº (*-N-*)$]_3$ +nº (*-IE-*)$]_4$ +Dº (*-to*)$]$ $[_{nP}$ Spec t_4 $[_{VOICEP}$ Spec t_3 $[_{VP}$ Spec t_2 $[_{\sqrt{P}}$ Spec $t_1]]]]]$

Some comments are in order here. I have claimed that thematic vowels are "verbalizers", i.e. they turn a categoriless root into a verbal stem. In my view,

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vowel is endowed with the feature [–bounded] which allows for an eventive interpretation of the derived noun in (14). The Aorist vowel, on the other hand, is endowed with the feature [+bounded] and denotes a (temporally) bounded and telic event. It is precisely this feature which contributes to the resultative semantics of both participles and participial nominalizations built on the Aorist base (see (15)). As for the imperfect tense base, due to its derivational relation to the present tense base, the relevant feature is again [–bounded] which, when merged on an aspect node (e.g. Asp^{I}P), licenses the process reading of the derived constituent (e.g. -NE nouns). For a similar analysis of these vowels, see Stancheva (2003).

this is a necessary step to take in order to enable the participial morphemes -N/-T to be further licensed and joined up. We also saw that present tense thematic vowels give an eventive interpretation to the derived nominal (14). In the case of Voice -IE nominals, however, this is not so. Although -IE nominals contain a thematic vowel, in the majority of cases they denote results of events or objects. I claim that this is due to the different type of the thematic vowel involved in the formation of these nouns and to the additional presence of the participial suffix. We saw that -IE nouns are participial in nature and are formed from the Aorist verbal base (see fn. 5). Hence, the thematic vowel which participates in their derivation is the Aorist one ('*-a*' in (15)). I claim that this vowel bears the feature [+bounded] which adds a resultative denotation to the derived nominal (see fn. 18). This result denotation is then further reinforced by the semantic contribution of the participial suffixes -N/-T themselves which, in my analysis, are Voice heads (see Cinque 1999: 101–103; Ferrari 2005) and have the effect of turning a verbal stem into a participle, thereby assigning a resultative meaning to the derived nominal.[19]

By now we can conclude that thematic vowels, being aspectual in nature, contribute to event structure. Thus, the Aorist vowels add a resultative interpretation to the derived noun due to their [+bounded] feature (15) whereas the present tense vowels, which bear the [–bounded] feature, assign an eventive denotation to the corresponding noun (14).

Finally, in the following section, I provide a syntactic analysis of the process -NE nominals.

3.3. The syntax of -NE nominals

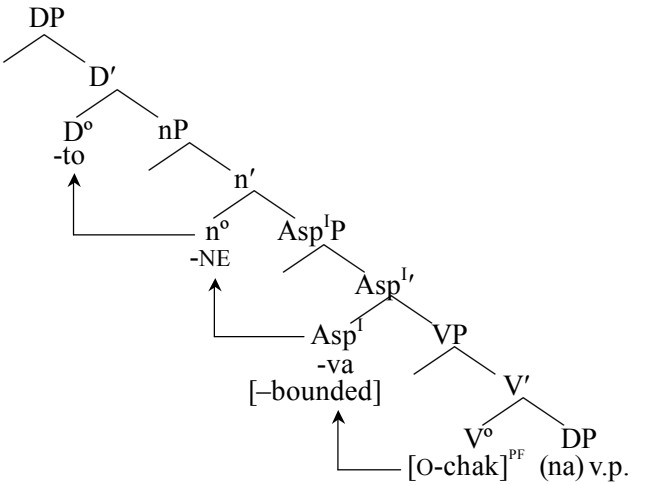
We already mentioned that -NE constructions are always formed from imperfective verbal bases and always allow for a process interpretation. I suggest

[19] Roeper and van Hout (1999) claim that the English adjectival suffix *-able* operates as a passivizer which results in the dethematization of the subject position. For them, passivizing *-able/-ed* suffixes subcategorize for a passive VoiceP with a [+Theme] feature on its specifier which then percolates to the next available specifiers in the derivation. Treating passivization (English *-able/-ed* or Bulgarian -N/-T suffixes) as a dethematization device related to a particular feature ([+Theme] in their analysis) explains why passive nominalizations, which inherit this passive feature, are of the result type, as there is no true Agent argument. Whether the relevant passivizing feature is also [+Theme] in Bulgarian -IE nouns is left for further investigation.

that there is a strong correlation between these two facts which allows me to propose the syntactic representation given in (16):[20]

(16) [O-*chak*]-*va-ne-to* *(*na*) *velik-a-ta promjana* 'the waiting for the great change' (see (4)):

a.



b. Head movement:

$[_{DP}$ Spec $[_{D^o}$ $[_{n^o3}$ $[_{AspI^o2}$ V^o_1 $([O\text{-}chak\text{-}]^{PF})$ + Asp^o (-*va*-)$]_2$ + n^o (-*NE*-)$]_3$ + D^o (-*to*)$]$ $[_{nP}$ Spec t_3 $[_{AspIP}$ Spec t_2 $[_{VP}$ Spec $t_1]]]]$

From (16) we see that the lexical category shows the prefix O-, which indicates that we have a verbal stem and not a root. The presence of the prefix further shows that this base is perfective due to the perfectivizing role of prefixes in general. Recall that -NE nouns are exclusively formed from imperfective verbal bases, which suggests that the -NE suffix always selects for such bases. Hence, the verb phrase (VP) in (16), being perfective, should consequently be imperfectivized so that the -NE suffix may be successfully attached. This is done by the addition of the secondary imperfective morpheme -*va* which, in my analysis, heads its own functional projection Aspect Imperfective Phrase (Asp^{I}P).[21] I suggest that -NE always selects for this Asp^{I}P

[20] For exceptions to this strong correlation, see fn. 4.

[21] Svenonius (2004a: 181) regards -(*a*)*va* as a thematic vowel. In my analysis the secondary imperfective suffixes merge as heads of their own functional projection Aspect Imperfective Phrase (Asp^{I}P). See Istratkova (2004) for a similar proposal.

projection and that it is the imperfective suffix, overt or covert, which is the syntactic object that accounts for the process reading of these nouns. From (16) we can also observe that the imperfective suffix *-va*, in the same way as the present tense thematic vowel in (14), is endowed with the feature [–bounded] (see fn. 18). However, this feature brings about an eventive reading in the former case (14) but a process one in the latter (16). I tentatively suggest that this is due to the fact that the lower verbal domain (VP) is related to eventivity whereas the higher aspectual domain is related to the process interpretation of nouns.[22] Hence, the same feature can bring about various interpretations within a nominalization depending on its attachment site. Alternatively, we may call the lower realization of the [–bounded] feature on V^o [+eventive] and its higher realization on Asp^{lo} [+process]. Finally, the correct morphological order of suffixes is obtained by head movement (16b).

To recapitulate, we have seen that the three morphological nominalization types differ syntactically. Thus, "other-suffix" nominals are derived by the merger of a root or a verbal stem with a nominalizing head n^o, where n^o is a gender morpheme or derivational suffix marked for gender. This suggests that such nouns denote objects or abstract concepts. The eventive interpretation of some of these nominals is explained by the additional presence of a present tense thematic vowel endowed with the feature [–bounded]/[+eventive] which, apart from verbalizing the structure, assigns an eventive reading to the derived noun. As for Voice -IE nominals, they are derived by the merger of a participial base with the nominalizing suffix -IE. Bearing in mind that participles are formed from the Aorist verbal base, it is the Aorist thematic vowel and its feature [+bounded], together with the passivizing function of the participial suffix -N/-T, which contributes to the result interpretation of these nouns (see fn. 19). Finally, the process reading of -NE nouns is accounted for by the fact that they embed a higher $Asp^{l}P$ whose head bears the feature [–bounded] which is interpreted as [+process].

The observations made so far indicate that there is a strong relationship between syntactic structure and interpretation, i.e. process, eventive, resultative, etc. An interesting question to ask is whether syntactic structure also governs argument structure. I will devote the following section to showing that functional structure does in fact govern argument structure.

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[22] A similar claim is found in Borer (1998: 65), who suggests that the aktionsart process/eventive distinction is also syntactically represented. Thus she claims that the lower argument position (my VP domain) is linked to an eventive interpretation whereas the higher one (my $Asp^{l}P$) relates to the process interpretation.

4. Some notes on argument structure

The goal of this section is to show that functional structure governs argument structure. That is, only in the presence of certain functional projections is argument structure licensed within a nominalization. More precisely, I will show that only when Asp^{I}P projects are internal arguments required.

Slightly modifying Grimshaw's (1990) classification of nominalizations, I will show that with respect to argument structure, deverbal nominals in Bulgarian can be divided in the following groups:

(17) a. Argument-structure nominals: Eventive nouns with obligatory internal arguments (Grimshaw's 1990 *Complex Event nominals*)
b. Participant-structure nominals: Eventive nouns with optional internal arguments (Grimshaw's 1990 *Simple Event nominals*)
c. Result nominals: Non-eventive nouns and therefore no internal arguments (Grimshaw's 1990 *Result nominals*)

Argument structure depends on event structure (Grimshaw 1990). Thus, non-eventive nouns can never project internal arguments and consequently fall under the group of result nominals (17c). Within this group we have result- and object-denoting "other-suffix" (18a), Voice -IE (18b) and -NE (18c) nominals. The relevant examples are provided below:

(18) a. [PO-*stroj*]-*ka-ta* (**na nov-a-ta* *sgrada*)
construct-KA-the.FEM.SG (**of* new-FEM.SG-the.FEM.SG building)
ot Ivan
by Ivan
'*the construction *of* the new building *by* Ivan'

b. **pis-a- n -ie-to* (**na kniga-ta*)
write-A.TH.VOW-N.PASS.PRT-IE-the.NEUT.SG (**of* book-the.FEM.SG)
ot Ivan
by Ivan
'*the written (thing) of the book by Ivan'

c. *jad-e-ne-to* *ot/na* *Ivan e na*
eat-E.TH.VOW-NE-the.NEUT.SG **by/from/of* Ivan is on
masa-ta
table-the.FEM.SG
'The meal **by/from/of* Ivan is on the table'

From the examples in (18) we observe that object-denoting nouns cannot have an eventive interpretation and hence do not allow for the projection of

internal arguments. In the case of the "other-suffix" nouns, this is due to the fact that such nouns are either built on roots without embedding any eventive functional projections (9c) or, alternatively, on perfective verbal bases (shown by presence of the prefix in (18a)). In the latter case such nouns are usually interpreted as the complement of this perfective base (i.e. *po-strojka* 'a construction' is something which has been constructed). As for the -IE nominals (18b), it is the Aorist thematic vowel which, together with the participial suffix -N/-T, brings about a resultative meaning to the derived noun.[23] Finally, the resultative denotation of some -NE nominals (18c) can be explained historically (see fn. 4).

As for the eventive nominalizations, there are two possibilities. If the internal argument is obligatorily required, we have true argument structure nouns (17a). If, on the other hand, the internal arguments are optional, the noun is a participant-structure one (17b). The external argument, however, is always optional in both cases. Let's first consider the second group (17b).

Eventive Voice -IE (19b) and eventive "other-suffix" nouns (19a) are participant-structure nominals in Bulgarian. They allow for internal and external arguments to be projected, though this is only optional.

(19) a. [PRO-*d*]-*a-žba-ta* (*na stok-i*) (*ot Ivan*)
sell-A.TH.VOW-ŽBA-the.FEM.SG (*of* goods-PL) (*by*/*from* Ivan)
'the sale of goods *by/from* Ivan'

b. *sŭbr-a-n-ie-to* (*na deputat-i-te*)
meet-A.TH.VOW-N.PASS.PRT-IE-THE.NEUT.SG (*of* deputy-PL-the.PL)
'the meeting *of* the deputies'

From the examples above we can observe that participant-structure nouns (19) allow for internal and external arguments to be projected. However, in neither case is their presence obligatorily required. Additionally, though the external argument allows for an Agent interpretation, it is not the only reading available since the Source (19a) and Possessor (19b) readings are also possible. Thus, in (19a), the *ot*-NP ('by-NP') can denote (i) that Ivan sells the goods (i.e. Ivan is the Agent), or (ii) that we have taken the goods we

[23] It is interesting to note that nouns derived from perfective (18a) and participial (18b) bases tend to give a result nominal which usually corresponds to the complement of the underlying verb (*po-strojkata* 'the construction' in (18a) means 'the thing that has been constructed', and *pisanieto* 'the written (thing)' in (18b) means 'the thing that has been written'). I leave this parallel for future investigation.

sell *from* Ivan (i.e. Ivan is the Source). These facts may further suggest that these nouns do not have true argument structure as they allow for various interpretations of the external argument and do not require their internal arguments obligatorily. We may conclude that, when they appear, the arguments of such nouns simply modify the event denoted by the noun. That is, they are modifiers of events rather than true obligatory arguments required by the verb. The above observations suggest that instead of argument structure, these nouns have a "participant" structure where the external and the internal arguments are participants in Grimshaw's (1990) terms.[24]

Now, let us consider the true argument-structure nouns. In Bulgarian, only some of the transitive (see (20a) and (20b)) and prefixed (20c) process -NE nominals have true argument structure and must therefore satisfy the Projection Principle, i.e. they require their internal arguments obligatorily.

(20) a. *resh-ava-ne-to* *(*na zadach-i-te*) (*ot Ivan*)
solve-ava.IMPF-NE-the.NEUT.SG *(*of* exercise-PL-the.PL) (*by* Ivan)
'the solving *of* the exercises *by* Ivan'

b. *chup-e-ne-to* (*na Ivan*) *(*na chash-i*)
break-E.TH.VOW-NE-the.NEUT.SG (*of* Ivan) *(*of* glass-PL)
'the breaking *of* glasses *by* Ivan'

c. [IZ-*p*(*e*)]-*java-ne-to* *(*na pesen-ta*) (*ot Maria*)
[IZ-sing]-java.IMPF-NE-the.NEUT.SG *(*of* song-the.FEM.SG) (by Mary)
'the singing *of* the *entire* song *on behalf of/by* of Mary'

In the case of true argument-structure nominals (20), not only is the internal argument obligatorily required, but the external one, when projected, is always interpreted as the Agent (Causer). This further suggests that it is the transitive (causative) nature of the verbal base that demands the projection of its internal argument. In the case of prefixed nominalizations (20c), we could suggest that prefixes, which are usually regarded as transitivizing devices (Filip 1999: 198), set certain requirements so that the internal argu-

[24] Grimshaw (1990) distinguishes between syntactic arguments, which stand in grammatically significant relation to predicates, and "participants". She claims that, among other things, the lexical conceptual structure defines a set of participants involved in the meaning of the lexical item. Whereas verbs and complex event nominals project participants in their argument structure and thus make their participants grammatical arguments, result and simple event nominals have only participants and no grammatical arguments.

ments are obligatorily projected. Thus, if the verbal base *peja* 'sing' remains unprefixed (21a), the internal argument is optional.

(21) a. *pe-e-ne-to* (*na pesen-ta)* *e korektno*
sing-E.TH.VOW-NE-the.NEUT.SG (*of* song-the.FEM.SG) is correct
'the singing *of* the song is correct'

b. *tich-a-ne-to* *e zdravoslovno*
run-A.TH.VOW-NE-the.NEUT.SG is healthy
'Running is healthy'

It can be seen that in the absence of prefixation (21a), or in cases where the verbal base is unergative (21b), process -NE nominals behave in the same way as participant-structure "other-suffix" and Voice -IE nominals (19) in that the projection of their internal arguments is optional.[25]

To sum up, we have seen that argument structure depends on eventivity. Thus, non-eventive nouns never project internal arguments, which suggests that they have no argument structure at all. As for the eventive nominalizations, there are two possibilities. On the one hand, there are nouns which allow for internal and external arguments to be projected, but this is only optional. Additionally, the external argument, when present, has various interpretations. Hence, these nouns are not true argument-structure nouns but rather participant-structure nominals. On the other hand, we also have true argument-structure nouns. This set consists of certain transitive (causative) and prefixed -NE nominals (20). These nouns project their internal arguments obligatorily. The external argument, though, is always optional. However, when present, it always denotes the Agent (Causer).

From the facts above we can conclude that functional structure does in fact govern argument structure. In the absence of eventive verbalizing projections such as eventive thematic vowels, nouns are unable to project internal arguments. As for the Voice -IE nouns, though such verbalizers project, they correspond to the Aorist thematic vowels which have a resultativizing function related to their feature [+bounded]. It is thus this feature, together with the passivizing role of the participial morpheme -N/-T, which assigns a result interpretation to the derived nominal. Thus, such nouns are prevented from projecting internal arguments as they fall within the group of result nouns (17c).[26] Finally, only some transitive (causative) and pre-

[25] Due to the limited scope of this paper, I will not deal with unaccusatives here.

[26] Recall that the possible eventive denotation (and hence participant structure) for these nominals is explained historically (see fn. 8).

fixed process -NE nominals can be true argument-structure nouns. The fact that they derive exclusively from imperfective verbal bases suggests that only in the presence of Asp^{I}P is argument structure allowed within a nominalization. However, when the base is unergative or unprefixed, such nouns are participant-structure nominals in that the internal arguments are no longer obligatorily required (21). This suggests that causation and prefixation do play a role in argument structure. Thus, only when Asp^{I}P projects and only when the verbal base is transitive-causative or prefixed are internal arguments obligatorily required within a nominal. Bearing in mind that causation and prefixation are structurally represented in syntax, this further supports the claim that functional structure governs argument structure.

Due to the fact that prefixation intervenes in argument structure seen in (20c) as opposed to (21a), I will devote the next section to a syntactic analysis of this phenomenon. It will become clear that apart from Aspect Imperfective Phrase (Asp^{I}P), which is always obligatory for argument structure, there are also other functional projections headed by perfectivizing prefixes which obligatorily require the projection of internal arguments.

5. The role of prefixation in the nominalizing process

Slavic prefixes are generally divided in two groups, lexical and super-lexical. Lexical prefixes are considered to have an unstable meaning and to display a rich idiosyncrasy. They are also claimed to derive completely new lexical items, i.e. verbs with new meanings. An example follows.

(22) a. *kaža* > DO-*kaža*
'say' > 'prove'

b. *dam* > PRO-*dam*
'give' > 'sell'

In contrast to lexical prefixes, super-lexical prefixes are claimed to have a stable meaning like '*begin*', '*finish*', '*again*', etc.

(23) a. *peja* > PO-*peja*
'sing' > 'sing FOR A WHILE'

b. *spja* > NA-*spja* *(*se*)
'sleep' > 'sleep ENOUGH'

From (23) we can see that super-lexical prefixes do not change the meaning of the verb they attach to but just modify it. They are also claimed to correspond to aspectual words or adverbial phrases in English and other languages (Babko-Malaya 1999: 76).

Some linguists claim that there is a third group of prefixes with a pure perfectivizing role (see Svenonius 2004a). These prefixes make an imper-

fective verb perfective and indicate that the process denoted by the verb is completed (Babko-Malaya 1999: 51). Consider the following examples:

(24) a. *jam* > *iz-jam* b. *melja* > *s-melja*
eat > IZ.PF-eat grind > S.PF-grind
'eat' (IMPF) > 'eat UP' (PF) 'grind' (IMPF) > 'grind UP' (PF)

In this paper I propose a slight modification of the classification suggested above. Thus, I prefer to treat prefixes in terms of inner and outer (aspectual) modifiers. The reason for such a modification is based on argument structure and the way prefixes interact with it. The fact that argument structure is syntactically represented below little verb Phrase implies that prefixes derived above *v*P (i.e. outer prefixes) cannot modify the selectional properties of the verbal base.[27] Rather, such prefixes are event modifiers, i.e. they modify the event as a whole. Therefore I regard these prefixes as outer aspectual modifiers. Inner prefixes, on the other hand, are derived *v*P-internally and operate on the internal parts of the event, i.e. its arguments. Thus, such prefixes are true argument structure modifiers. The reason I abandon the established classification of prefixes into lexical and super-lexical is due to the fact that super-lexical prefixes, which are claimed to be derived outside Verb Phrase (VP in Svenonius 2004b) and hence should correspond to outer prefixes in my analysis, do not constitute a unified class, as there are both inner (23b) and outer (23a) prefixes within this group.[28] Thus, I do away with the misleading term "super-lexical" and divide this group in two separate classes: inner and outer prefixes. The group of the purely perfectivizing prefixes (24) is also done away with because such prefixes also fall within the group of inner prefixes. Finally, lexical prefixes (22) are main-

[27] I claim that argument structure is realized *v*P-internally due to the fact that causative prefixes (e.g. RAZ- in Bulgarian) change the argument structure of the verb they attach to. Such prefixes transitivize an otherwise intransitive verbal base, thus adding an argument to the unprefixed verb (e.g. RAZ-*placha bebeto* 'make the baby cry', from *placha* 'cry'). Given that such morphemes are argument structure modifiers, then we may conclude that argument structure is realized *v*P-internally.

[28] A similar proposal is offered in Svenonius (2004b) whereby prefixes are divided into VP-internal (lexical) and VP-external (super-lexical), i.e. my *inner* and *outer* prefixes respectively. Contrary to Svenonius (2004b), I claim that cumulatives and distributives are argument structure modifiers, i.e. my *inner* or his VP-internal prefixes, whereas for him they are VP-external, i.e. my *outer* prefixes.

tained as a separate class due to the fact that they are derived pre-syntactically, i.e. in the Lexicon.

In what follows I offer a syntactic analysis of prefixation within the nominalizing process.

5.1. The syntax of lexical prefixes

Due to the fact that lexical prefixes derive new lexical items (22), I propose that they are inserted pre-syntactically, i.e. as part of a complex verbal head (indicated by square brackets throughout the paper). Additional evidence for such a claim is found in the fact that all nominalizations can be formed on lexically prefixed verbs (25). A syntactic derivation follows in (26).

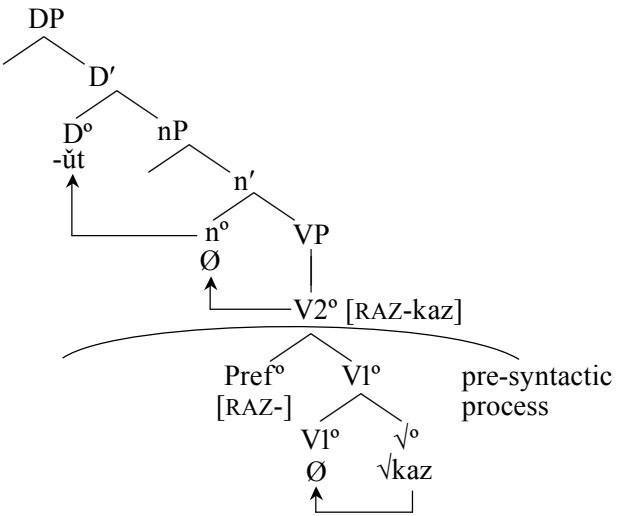
(25) a. Gender-derived nominalizations
[RAZ-*kaz*]-*ŭt* *za detsa*
[RAZ-say]-the.MASC.SG for children
[narrate]-the.MASC.SG for children
'the story/narration for children'

b. "Other-suffix" nominals
[PRO-*d*]-*a-žba-ta* *na diamant-i*
[PRO-give]-A.TH.VOW-ŽBA-the.FEM.SG of diamond-PL
[sell]-A.TH.VOW-ŽBA-the.FEM.SG of diamond-PL
'the sale of diamonds'

c. Voice -IE nominals
[NA-*kaz*]-*a-n-ie-to* *na Ivan*
[NA-say]-A.TH.VOW-N.PASS.PRT-IE-the.NEUT.SG of Ivan
[punish]-A.TH.VOW-N.PASS.PRT-IE-the.NEUT.SG of Ivan
'the punishment of Ivan/Ivan's punishment'

d. -NE nominals
[RAZ-*kaz*]-*va-ne-to* *(*na vits-ove*)
[RAZ-say]-va.IMPF-NE-the.NEUT.SG *(of joke-PL)
[tell/narrate]-IMPF-NE-the.NEUT.SG *(of joke-PL)
'the telling of jokes'

(26) Gender-derived nominalizations (see (25a)):

a. 

b. Head movement:
$[_{DP}$ Spec $[_{D^o}$ $[_{n3^o}$ $[_{V2^o}$ PREF^o (*RAZ-*) + $[_{V1}\sqrt{^o}_1$ (*kaz-*) + V1^o (*-Ø-*)]]$_2$ +n^o (*-Ø-*)]$_3$ +D^o (*-ŭt*)] $[_{nP}$ Spec t_3 $[_{V2P}$ Spec t_2 $[_{\sqrt{P}}$ Spec t_1]]]]

From (26) above we observe that the idiosyncratic prefix RAZ- merges in syntax as part of the complex verbal head V2º [RAZ-kaz] 'narrate'. I claim that this process of incorporation of the lexical (idiosyncratic) prefix into the V1º head takes place pre-syntactically, i.e. in the Lexicon, where idiosyncratic processes are considered to occur. A similar proposal, though not identical, is made in Svenonius (2004b), where it is proposed that the lexical prefix and the root are pre-syntactically stored as an idiom. Locating the lexical prefixes inside the verb phrase is supported by the fact that such prefixes can change the valence and case government properties of the verb (Filip 1999: 198) and further explains the fact that all nominalizations can be derived from such lexically-prefixed verbal stems as in (25). This is not the case, however, with the group of the outer prefixes, since not all nominalization types can be aspectually modified by them. It will also become clear that this incompatibility is syntactic in nature, i.e. it is the syntactic derivation of nominals which (dis)allows outer prefixation within the nominalizing process. In what follows I present a syntactic analysis of outer prefixes.

5.2. The syntax of outer prefixes

I have already mentioned that outer prefixes do not change the meaning of the verb they attach to (see (23a)). Rather, they modify it in a similar way to what adverbials do. Additionally, Istratkova (2004) claims that these prefixes appear in a fixed order when stacking, behaving thus in a similar way to adverbials, which are also hierarchically ordered.[29]

In Bulgarian, we can distinguish between temporal, degree and reversive outer prefixes. Within the temporal group we have phasal inceptive (27a), phasal terminative (27b), durative (27c), repetitive (27d) and anterior (27e) prefixes, among others:

(27) a. *za-placha*
ZA-cry
'*start to* cry'

b. *do-pija*
DO-drink
'*finish* drinking'

c. *po-placha*
PO-cry
'cry *for a while'*

d. *pre-mislja*
PRE-think
'think *again*'

e. *pred-platja*
PRED-pay
'pay *in advance*'

Phasal prefixes, like phase verbs, make reference to a particular phase of the event such as 'begin', 'finish', etc. In the same way as phase verbs, these prefixes select for homogeneous (i.e. imperfective) verbal bases.[30] As for duratives (27c), they delimit the event temporally whereby the interpretation we get is 'for a while'. Repetitive prefixes (27d), on the other hand, select for perfective bases and denote iteration in time, i.e. they indicate that the verbal action is performed for a second time. Finally, the anterior prefixes (27e) can be roughly paraphrased as 'to V in advance'.

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[29] Stacking is a phenomenon where two or more prefixes attach to a single verbal base. In Bulgarian, prefixes appear in the following hierarchy when stacking: *attenuative PO- > inceptive ZA- > terminative DO- > completive IZ- > distributive PO- > cumulative NA- > excessive RAZ- > repetitive PRE->* semelfactive suffix -N > lexical prefix(es) > VP (from Istratkova 2004: 318).

[30] In contrast to inceptive prefixes which select exclusively for imperfective verbal bases (i: b), the terminative prefix DO- can also attach to perfective ones (ii: a). This may be due to the fact that perfectivity is semantically more closely related to the notion of final result (i.e. terminativity) than to an initiation (i.e. inceptivity), thus allowing perfective verbs to be embedded under terminative prefixes:

(i) a. *[ZA-[PRO-peja]^{PF}]^{PF} b. [ZA-peja^{IMPF}]^{PF} 'start singing'
(ii) a. [DO-[PRO-dam]^{PF}]^{PF} b. [DO-peja^{IMPF}]^{PF} 'finish singing'

Apart from temporal modification, outer prefixes can make reference to the degree or intensity at which the event is performed. Thus, prefixes can be high (28a) or low (28b) degree modifiers:

(28) a. *pre-jam*
PRE-eat
'eat *excessively'*

b. *po*-[PRO-*dam*]
PO-[sell]
'sell *a little bit*'

The degree modifiers can either strengthen (28a) or lower (28b) the intensity of the verbal action. The latter group (28b) is traditionally known as "attenuative" prefixes. A comment is in order here. Istratkova (2004) observes that attenuative PO- (28b) attaches mainly to perfective bases and in the event of stacking modifies the meaning of the preceding prefix. Thus, *raz-prodam* 'sell everything/in excess' when modified by PO- (e.g. *po-raz-prodam*) acquires the meaning of 'sell almost everything' which suggests that the hierarchically higher PO- prefix scopes over the lower RAZ- one, lowering its intensity. In fact, scope relations are typical in stacking, where higher prefixes always scope over lower ones within the aspectual hierarchy.

As for reversive prefixes, they indicate a reverse action (e.g. *raz-vŭrža* [RAZ-tie] 'untie'). .

From the examples above we can observe that outer prefixes are adverbial in nature. However, in neither case are they able to modify the argument structure of the verb they attach to and consequently the argument structure of the nominalization in which they appear. In order to syntactically derive outer prefixes, I follow Cinque (1999) and assume that aspectual features are ordered along a fixed hierarchy of functional projections as in (29):

(29) Cinque's (1999) hierarchy of aspectual features (see Cinque 2002: 47):

$\text{MoodP}_{\text{speech act}} \ldots > \text{AspP}_{\text{terminative}} > \text{AspP}_{\text{continuative}} > \text{AspP}_{\text{perfect}} \ldots > \text{AspP}_{\text{inceptive(I)}} \ldots > \text{AspP}_{\text{completive(I)}} >$ Aspect Pl completive > VoiceP (PRT -N/-T) $> \text{AspP}_{\text{repetitive(II)}} > \ldots > \text{AspP}_{\text{inceptive(II)}} > \text{AspP}_{\text{completive(II)}} > (\text{Asp}_{\text{Q}}\text{P}) > \text{V}$

I adopt the hierarchy in (29) because it presents the full spectrum of possible aspectual features. Additionally, and more important for the proposals made here, it also includes a position for Voice features. According to Cinque (1999), all past participles of active and passive verbs initially generate under VoiceP. This would mean that the past passive participial morpheme -N/-T heads this projection. Evidence for such a claim is found from the unavailability of certain prefixes within some nominalizations.

In (30) we see that whereas -NE nouns accept any kind of outer prefixes as in (30a) and (30a′), the -IE nominals in (30b) and (30b′) and eventive "other-suffix" nouns in (30c) and (30c′) allow only for the repetitive PRE-.

(30) a. PRE-[PRO-*d*]-*ava-ne-to* *na tursk-i* *stok-i*
AGAIN-[sell]-ava.IMPF-NE-the.NEUT.SG of Turkish-PL goods-PL
'the selling again of Turkish goods'

a′. IZ-PO-PRO-*chit-a-ne-to*
COMPLETELY-LITTLE BY LITTLE-THROUGH-read-a.IMPF-NE-the.NEUT.SG
na vestnits-i-te
of newspaper-PL-the.PL
'the reading through completely little by little of the newspapers'

b. PRE-*vŭzpit-a-n-ie-to* *e trudna zadacha*
AGAIN-educate-A.TH.VOW-N.PASS.PRT-IE-the.NEUT.SG is difficult task
'The re-education is a difficult task'

b′. *IZ-*uvoln-e-n-ie-to*
COMPLETELY-dismiss-E.TH.VOW-N.PASS.PRT-IE-the.NEUT.SG
na rabotnits-i-te
of worker-PL-the-PL
'*The complete dismissal of the workers'

c. PRE-[PRO-*d*]-*a-žba-ta* *na tursk-i* *stok-i*
AGAIN-[sell]-A.TH.VOW-ŽBA-the.FEM.SG of Turkish-PL goods-PL
'the sale again of Turkish goods'

c′. *IZ-[PRO-*d*]-*a-žba-ta* *na tursk-i* *stok-i*
COMPLETELY-[sell]-A.TH.VOW-ŽBA-the.FEM.SG of Turkish-PL goods-PL
'*the sale completely of Turkish goods'

I claim that the unavailability of certain prefixes within a nominalization depends on the attachment site of the particular nominalizing head within the aspectual hierarchy in (29). However, once the verbal stem is nominalized, aspectual prefixation, being verbal in nature, is not no longer allowed inside the nominalization.

The fact that -NE nominals accept any prefix as shown in (30a) and (30a′) tells us that the nominalizer -NE is located above the highest prefix in the aspectual hierarchy in (29). Thus, on its way to nP, the verbal stem can, in principle, pick up any prefix before it gets nominalized. This is in fact a natural outcome. Recall that -NE nouns are always derived from imperfective verbal bases. However, in cases where there is a prefix, the base becomes perfective. Therefore, in order to form a -NE noun, we should addi-

tionally imperfectivize the base by means of the secondary imperfective suffix (e.g. *-ava* in (30a)). This further suggests that the secondary imperfective suffix derives above all of the prefixes available in the structure so that it could scope over them and imperfectivize the prefixed base. Once imperfectivized, the nominalizer -NE attaches. That is, -NE is always derived on top of the secondary imperfective (in the case of prefixation) and hence on top of all of the prefixes. As a result, any prefix is allowed within a -NE nominal.

When we derive a Voice -IE nominal, however, the nominalizing suffix -IE always attaches on top of the participial morpheme -N/-T (e.g. *vŭzpit-a-N-IE* 'education'). Bearing in mind that participles project as Voice heads, this suggests that the verbal stem nominalizes immediately on top of VoiceP, which hosts the suffix -N/-T. Once nominalization has taken place, there is no further prefixation. This would suggest that aspectual projections above VoiceP would be incompatible with such nominals. Thus, such nouns would allow only for lower prefixes such as the repetitive PRE- (30b).

As for the eventive "other-suffix" nouns, I propose that the nominalizer -ŽBA in (30c), as well as other nominalizers of this nominalization type, attaches at the same height as the Voice -IE nominalizer. Thus, only lower prefixes located below VoiceP are accepted in such nominalizations.[31]

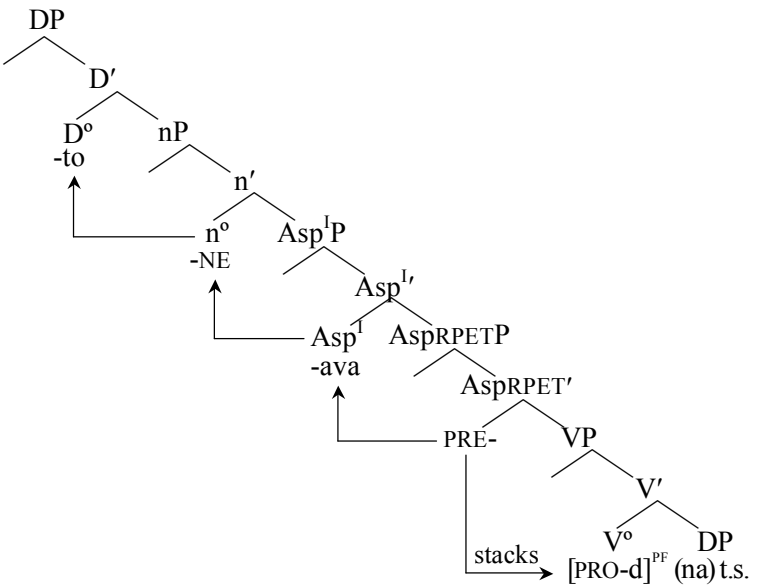
In (31) I offer a syntactic analysis of outer prefixation within a -NE noun (see (30a)). The same procedures hold for all other nominalization cases:[32]

[31] The suffix -(N)IE has a Russian origin and there is a tendency to replace nouns ending in -(N)IE with other synonymous "other-suffix" nominals (e.g. *stremle-*NIE >*strem-*EŽ 'striving, aspiration'). The fact that -(N)IE nouns are complementary with "other-suffix" nouns suggests that the corresponding nominalizers (-(N)IE, -EŽ, etc.) are derived under the same functional projection, i.e. VoiceP.

[32] I follow the traditional labeling of prefixes with the following abbreviations: (i) Inceptive: INCP; (ii) Terminative: TRMN; (iii) Completive: CMPL; (iv) Delimitative: DLMT; (v) Attenuative: ATTN; (vi) Distributive: DSTR; (vii) Cumulative: CMLT; (viii) Repetitive: RPET; and (ix) Excessive: EXCS.

(31) PRE-[PRO-*d*]-*ava-ne-to na turski stoki* 'the reselling of Turkish goods'

a.



From the representation in (31) we see that the lexical category shows the prefix PRO-, which suggests that we have a pre-syntactically derived verbal stem as in (26). Hence, the prefix PRO- enters syntax on a complex perfective verbal head $[_{V^o}$PRO-d$]^{PF}$ 'sell' which then undergoes further prefixation by the repetitive prefix PRE-. I suggest that prefixes merge in syntax as heads of their own functional projections and attach to the previous syntactic object via stacking, i.e. without movement.[33] After prefixation, the complex perfective head $[_{AspRPET^o}$AspRPETº (*PRE*-) +Vº ([*PRO-d*-])] is then imperfectivized by head-moving into Asp^{Io}, which is headed by the imperfective suffix *-ava*. The newly formed multiple head $[_{AspI}$[AspRPETº (*PRE*-) +Vº ([*PRO-d*-])] $+Asp^{Io}$(*-ava*-)] is further nominalized by incorporating itself into the nº head, which hosts the -NE nominalizer ($[_{n^o}$ $[_{AspI}$[AspRPETº (*PRE*-) +Vº ([*PRO-d*-])] $+Asp^{Io}$(*-ava*-)] + nº (*-NE*-)]. Finally, the definite article *-to* is attached to this complex nominalized head again by head movement, which results in $[_{D^o}[_{n^o}$ $[_{AspI}$[AspRPETº (*PRE*-) +Vº ([*PRO-d*-])] $+Asp^{Io}$(*-ava*-)] + nº (*-NE*-)] +Dº (*-to*)].

[33] Prefixes can be also merged in the specifier positions of their corresponding aspectual projections. As an anonymous reviewer suggests, this will further draw a parallel between prefixes and operator-like elements which are also located in specifiers. However, for consistency with the syntactic derivation of lexical prefixes, I assume all prefixes to be merged as heads.

From the representation above we see that the theme argument is derived as a complement to V′ (or else, √′ as in (38) below). Chomsky (1986) assumes that nouns and adjectives are inherent case assigners which assign genitive to their nomial complements under theta role assignment. He further suggests that inherent genitive is morphologically realized by the insertion of the dummy preposition *of*. Following this line of thought, I consider the preposition *na* 'of' in (31) and similar derivations to be the overt morphological and post-syntactic realization of inherent genitive assigned to the nominal complement 'Turkish goods' by the head noun 'selling'.[34]

We have already mentioned that outer prefixes cannot intervene in argument structure modification. Thus, such prefixes operate once the whole event is constructed, i.e. on top of *v*P. This is not the case, however, with the inner prefixes. I offer my syntactic analysis of inner prefixes in what follows.

5.3. The syntax of inner prefixes

Inner prefixes can be divided in two groups: prefixes which introduce unselected internal arguments and others which quantificationally modify an already introduced internal argument. In this group I include quantificational cumulative, distributive, excessive, and purely perfectivizing prefixes.[35]

With transitive bases, the quantificational inner prefixes quantify over the internal argument cumulatively, i.e. resulting in the interpretation of 'many' (e.g. NA- in (32a)) or distributively, i.e. indicating a unique but distributed action consisting of separate acts and consecutively enveloping all of the objects (e.g. PO- in (32b)):

(32) a. *na-pŭrž-va-ne-to* *na kartof-i*
NA-fry-va.IMPF-NE-the.NEUT.SG of potato-PL
'the frying of enough/many potatoes'

b. *iz- po-na- raz-*[PRO-*d*]*-ava-ne-to* *na knig-i*
COMPLETELY-ONE BY ONE-MANY-EXCESSIVELY-[sell]-ava.IMPF-NE-the.NEUT.SG of book-PL
'the selling of many books in excess completely *one by one*'

---

[34] For alternative analysis, see Borer (1999), where *of*- insertion is dealt with in terms of structural case assignment.

[35] I will not deal with the topic of spatial and causative inner prefixes here due to the limited scope of this paper (see Markova and Padrosa-Trias 2009 for details).

Cumulative (32a) and distributive (32b) prefixes are traditionally regarded as super-lexical (Svenonius 2004a). However, such prefixes are not event modifiers in the way the outer ones from (27) and (28) are. In contrast to outer prefixes, cumulatives, for example, quantify over the internal argument and do obligatorily require its presence, having therefore a direct relation to argument structure. Thus, if an unergative verb is cumulatively prefixed, the reflexive is obligatorily introduced in the structure so that the prefix can operate on it (33a). That is, such prefixes introduce unselected (internal) arguments with unergatives.

(33) a. *na-spa-h* *(*se*)
NA-sleep-1PS.SG.AOR *(se.REFL)
'I slept *enough*/*sufficiently*'

b. *na-spi-va-ne-to*
NA-sleep-IMPF-NE-the.NEUT.SG
'the (*enough*) sleeping'

Traditionally, the prefix NA- in (33) is labelled as super-lexical "saturative", where the interpretation we get is 'to one's heart's content'. The saturative reading with such prefixes, however, is related to the intransitive nature of the verbal base. When combined with an unergative verb such as *spja* 'sleep' (33), the prefix quantifies over the unique event's participant, i.e. the external argument, implying thus the agent's satiation. Hence, I claim that NA- from (33) and NA- from (32a) are the same instantiation of cumulativity with possible interpretational differences being due to the (in)transitive nature of the verbal base.

The excessive prefix RAZ-, though traditionally regarded as super-lexical, is also an inner prefix in my analysis due to the fact that it behaves in a similar way to the cumulative NA-. From (34) below we can observe that when RAZ- combines with a transitive base, it quantifies over the internal argument, giving the interpretation of 'many/in excess' (34a). If, on the other hand, the base is unergative, then the reflexive clitic *se* is introduced in the structure (34b). Due to the fact that the clitic is co-referenced with the unique verb's participant, i.e. the Agent, then it is the Agent which is quantificationally modified by the prefix. Thus, the interpretation we get is 'the running of many people' as in (34c). Hence, I suggest that the same prefix RAZ- is involved in (34a), (34b) and (34c), the only difference being the (in)transitivity of the verbal base.

(34) a. *raz*-[PRO-*d*]-*ava-ne-to* *na knig-i*
RAZ-[sell]-ava.IMPF-NE-the.NEUT.SG of book-PL
'the selling of (many) books in excess'

b. *Raz-tich-aha* *(*se*) *hora*
RAZ-run-3PS.PL.AOR *(se.REFL) people
'*Many* peoples started running'

c. *raz-tich-va-ne-to* *na hora*
RAZ-run-va.IMPF-NE-the.NEUT.SG of people
'the running of *many* people'

Finally, I have already mentioned that the purely perfectivizing prefixes are treated as inner (i.e. argument structure) modifiers in my analysis. This is due to the fact that, like cumulatives, pure perfectivizers require the projection of the internal argument obligatorily. Thus, in (35a) we see that, when unprefixed, the verb *jam* 'eat' can appear without any internal argument, whereas when prefixed such an argument is obligatorily required (35b).

(35) a. *jad-e-ne-to* *mi dostavja udovolstvie*
eat-E.TH.VOW-NE-the.NEUT.SG me gives pleasure
'Eating gives me pleasure'

b. IZ-*jažd-a-ne-to* *(*na zakuska-ta*)
IZ.PF-eat-A.IMPF-NE-the.NEUT.SG *(of breakfast-the.FEM.SG)
'the eating UP *(of the breakfast)'

Pure perfectivizers are quantificational in nature, hence also semantically related to inner quantificational prefixes. The difference between cumulatives from (32a) and (33) and pure perfectivizers (35b), for example, is that the former lead to the interpretation that 'many' of the argument's quantity were affected whereas the latter denote that the entirety of the argument was affected. Thus, (35b) denotes that all of the breakfast is eaten up, not some portion of it. As for their derivation, I follow Borer (2002) and propose that they are derived syntactically as heads of Aspect Quantity Phrase (Asp_QP).

For Borer (2002), Slavic languages assign a quantity value directly onto the head of Asp_QP by means of perfectivizing prefixes. Having marked the head of Asp_QP as [+quantity], this further requires the presence of a theme DP argument on which the prefix operates. Stated differently, the prefix is an operator-like element which binds a variable in the internal argument. This further explains the fact that prefixed nouns do not allow for the omission of their internal arguments, i.e. they are argument-structure nouns in the majority of the cases. As for cumulative, distributive and excessive inner prefixes, they project as heads of their own functional projections (see fn. 32).

Similarly to outer prefixes, inner prefixes also appear in a fixed hierarchy and allow for stacking (see fn. 29). Additionally, their distribution is also restricted within certain nominalizations. Thus, only -NE nominals systematically allow for any inner prefix, shown in (32), (33b), (34a), (34c), and (35b). By contrast, "other-suffix" (36) and Voice -IE (37) nouns, they allow only for pure perfectivizers to project inside them.

(36) a. *belja* 'peel' > O-*belja* 'PF-peel' > O-*bel-ka* 'peeling'
b. *ucha* 'study' > NA-*ucha* 'PF-study' > NA-*u-ka* 'science'
c. *stroja* 'build' > PO-*stroja* 'PF-build' > PO-*stroj-ka* 'building'

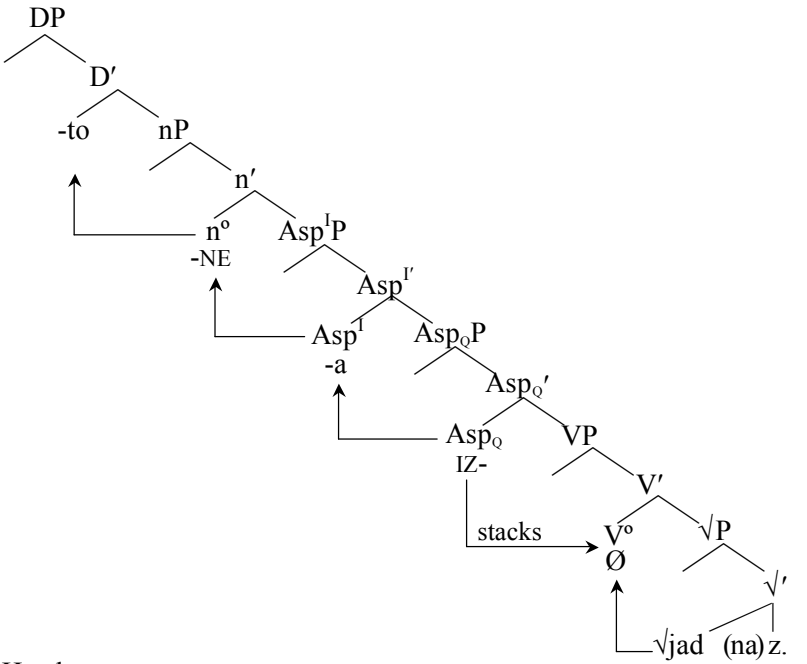
(37) a. *rusha* 'destroy' > RAZ-*rusha* 'PF-destroy' > RAZ-*rush*-E-N-IE 'destruction'
b. *sadja* 'plant' > NA-*sadja* 'PF-plant' > NA-*sažd*-E-N-IE 'plantation'
c. *žertv-uvam* 'sacrifice-IMPF' > PO-*žertv-uvam* 'PF-sacrifice' > PO-*žertv-uva*-N-IE 'sacrifice'

Recall that the nominalizers -KA in (36) and -IE in (37) project on top of VoiceP (see fn. 31). Therefore only the prefixes heading the projections below VoiceP are acceptable within such nominals. Pure perfectivizers, in my analysis, are derived under Asp_QP located below $AspP_{completive(II)}$ (see (29)), i.e. below VoiceP.[36] Therefore such prefixes are compatible with both "other-suffix" and Voice -IE nominalizations. A syntactic representation follows:

[36] Evidence for this is provided by the fact that when they co-occur with completive prefixes (e.g. IZ-), pure perfectivizers (e.g. NA-) are hierarchically lower. Therefore the projection heading pure perfectivizers, i.e. Asp_QP, is located below the projection heading completive prefixes, i.e. Cinque's $AspP_{completive(II)}$: e.g. IZ-NA-*pisah uprajnenijata* 'I wrote (all) the exercises completely'.

(38) IZ-*jažd-a-ne-to na zakuskata* 'the eating up of the breakfast' (see (35b)):

a.



b. Head movement:
[$_{DP}$ Spec [$_{Dº}$ [$_{n5º}$ [$_{AspI4}$ [$_{AspQ3}$ Asp$_{Q}$ (*IZ-*) + [$_{Vº2}$ √º$_{1}$ (*jad-*) + Vº (-*Ø-*)]$_{2}$]$_{3}$ + Aspᴵ (-*a-*)]$_{4}$ + nº (-*NE-*)]$_{5}$ + Dº (-*to*)] [$_{nP}$ Spec t_5 [$_{AspIP}$ Spec t_4 [$_{AspQP}$ Spec t_3 [$_{VP}$ Spec t_2 [$_{√P}$ Spec t_1]]]]]]

In (38) we see that the root is verbalized by incorporating itself into the null verbal head by head movement. Evidence for verbalization is found in the palatalization of the final root consonant [D] to [Ž]. After verbalization takes place, the prefix IZ-, an Asp$_{Q}$ head, stacks in situ onto this verbalized [$_{Vº}$√º (*jad-*) + Vº (-*Ø-*)] complex head requiring thus the obligatory presence of its theme argument. After prefixation, the prefixed complex head [$_{AspQ}$ Asp$_{Q}$ (*IZ-*) + [$_{Vº}$√º (*jad-*) + Vº (-*Ø-*)]] then further incorporates into Aspᴵ head so that the imperfective suffix *-a*, an Aspᴵ head, can appear on its right.[37] The

[37] Asp$_{Q}$P is necessarily derived below the AspᴵP. Consider the examples below:
(i) a. *jam* 'eat' (IMPF) b. IZ-*jam* 'eat up' (PF) c. IZ-*jažd-am* 'PF-eat-a.IMPF' (IMPF)
From (i) we see that perfectivizing prefixes attach to primary imperfective verbs (a) and thus make them perfective (b). The newly formed perfective verb (b) can then be further made imperfective via secondary imperfective suffixation (c). This would suggest that the secondary imperfective morpheme derives higher up in the structure. For this reason, AspᴵP would need to be derived above Asp$_{Q}$P.

newly formed imperfectivized multiple head formation [$_{\text{Asp}_\text{I}}$ [$_{\text{Asp}_\text{Q}}$ Asp_Q (*IZ*-) + [$_{\text{V}^\text{o}}\sqrt{}^\text{o}$ (*jad*-) + V^o (-*Ø*-)]] + Asp^I (-*a*-)] is then nominalized by head-moving into n^o, where the -NE suffix is attached [$_{\text{n}^\text{o}}$ [$_{\text{Asp}_\text{I}}$ [$_{\text{Asp}_\text{Q}}$ Asp_Q (*IZ*-) + [$_{\text{V}^\text{o}}\sqrt{}^\text{o}$ (*jad*-) + V^o (-*Ø*-)]] + Asp^I (-*a*-)] + n^o (-*NE*-)]. Finally, the definite article -*to*, being a suffix, is added to the nominalized head by incorporating n^o into D^o as follows: [$_{\text{D}^\text{o}}$ [$_{\text{n}^\text{o}}$ [$_{\text{Asp}_\text{I}}$ [$_{\text{Asp}_\text{Q}}$ Asp_Q (*IZ*-) + [$_{\text{V}^\text{o}}\sqrt{}^\text{o}$ (*jad*-) + V^o (-*Ø*-)]] + Asp^I (-*a*-)] + n^o (-*NE*-)] + D^o (-*to*)]. The detailed derivation is offered in (38b).

6. Some concluding remarks

In this work I have tried to show that functional structure governs argument structure and that only in the presence of certain functional projections is argument structure licensed within a nominalization. Thus, I have tentatively claimed that only when Aspect Imperfective Phrase (Asp^IP) projects, together with certain projections headed by perfectivizing prefixes such as Aspect Quantity Phrase (Asp_QP), is argument structure licensed within a nominal. We have also seen that without event structure there is no argument structure and that nominals can be divided into argument-structure, participant-structure and result nouns. As for the eventive denotation of nominals, I have proposed that this is also functionally (i.e. syntactically) dependent, i.e. the eventive denotation is licensed by eventive thematic vowels which project as verbal (V) heads and additionally verbalize the structure. Thus, true argument-structure nominals are those formed from Asp^IP and which additionally embed Asp_QP; participant-structure nouns are those which contain eventive thematic vowels in their structure but lack an Asp^IP, whereas result nouns are those which contain neither thematic vowels nor Asp^IP projections, or else contain result-denoting thematic vowels such as the Aorist one. As for prefixes, I have suggested that they do not move in syntax. Rather, they stack to the preceding verbal(ized) structure in situ.

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Deadjectival nominalizations and the structure of the adjective

Isabelle Roy

1. Introduction

Much work on nominalizations is concerned with deverbal nominals (Chomsky 1970; Grimshaw 1990; Picallo 1991; Marantz 1997; Alexiadou 2001; Borer 2003, among many others), and much less attention has been paid in the literature to deadjectival nominals, i.e., nominals derived from adjectives, as in French *nu-nudité*, *abstrait-abstraction*, and their English counterparts *nude-nudity*, *abstract-abstraction*. In this paper, I analyze the formation of deadjectival nominals and their internal syntactic and semantic properties.

Let us start with a puzzle. In the pair in (1), an intuitive relationship exists between the nominal (1b) and its predicative counterpart involving the related adjective (1a):

(1) a. *Cette voyelle est nasale.*
this vowel is nasal
b. *la nasalité de cette voyelle*
the nasality of this vowel

The nominal *nasalité* shares with the adjective *nasal* a core meaning (i.e., abstract lexical concept related to 'nose') and a clear morphological root (i.e., /nazal/ in French). Both the adjective and its morphologically related nominal share also an argument structure. In both cases in (1), the nominal phrase *cette voyelle* 'this vowel' expresses the holder of the state described by the adjective (and is realized as an external argument; cf., (1a)) or the nominal (and is introduced in a *de*-phrase complement of the nominal head; cf., (1b)). Indirect arguments, as in (2), further emphasize the same point:[1]

[1] Exceptions exist, but are presumably only linked to the fact that French does not allow multiple *de*-phrases (i). See also footnote 11:
(i) a. *Pierre est fier de ses enfants.*
Pierre is proud of his children
b. *la fierté de Pierre *de ses enfants / pour ses enfants.*
the pride of Pierre of his children for his children

(2) a. *Tom est gentil envers sa mère*
Tom is kind towards his mother
b. *la gentillesse de Tom envers sa mère*
the kindness of Tom towards his mother

There are, thus, reasons to believe that the nominal *nasalité* is derived from *nasal* and that such derivation is achieved through affixation with the nominal morpheme *–ité* to the adjectival form *nasal*.

Adjectives can also be used attributively, i.e., as noun modifiers, and it is not surprising to find pairs such as (3) in parallel of (1):

(3) a. *une voyelle nasale*
a vowel nasal
'a nasal vowel'
b. *la nasalité de la voyelle*
the nasality of the vowel

What is surprising, however, is the contrast between (3) and (4), below. While nominalization of *nasal* is possible when it modifies *voyelle* 'vowel' in (3), it is impossible when it modifies *cavité* 'cavity' in (4) (see also Fradin and Kerleroux 2003). Given the existence of the form *nasalité* in French, derived from the adjective *nasal*, the ungrammaticality of (4b) compared to the grammaticality of (3b) is rather unexpected:[2]

(4) a. *une cavité nasale*
a cavity nasal
'a nasal cavity'
b. **la nasalité de la cavité*
the nasality of the cavity

Such contrasts are *not* isolated and can easily be repeated for other adjectives as well (examples accredited to Dell 1970 in Fradin and Kerleroux 2003):

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[2] Importantly, *cavité nasale* is not an idiom and the meaning of the adjective is clearly retrievable, as found in (i) as well. In principle, thus, there is no structural effect blocking the nominalization in (4b) and the adjective *nasal* in (4) should be a potential candidate for a nominalization:

(i) a. *écoulement nasal*
discharge nasal
'nasal discharge'
b. *artère nasale*
artery nasal
'nasal artery'
c. *protubérance nasale*
bump nasal
'nasal bump'

(5) a. *une chanson populaire*
a song popular
'a popular song'
b. **la popularité de cette chanson*
the popularity of this song

(6) a. *les traditions populaires*
the traditions popular
'the people's traditions' (cf. popular beliefs, popular vote)
b. *la popularité de ces traditions
the popularity of these traditions

Fradin and Kerleroux (2003) have noted that 'relational' adjectives (Bally 1944; Levi 1978; McNally and Boleda 2004; Fábregas 2007) resist systematically the formation of abstract nominals with *-ité*, while qualifying adjectives allow it. Whereas this would explain the contrast between (3) and (5) (with a qualifying adjective) *vs*. (4) and (6) (with a relational one; more on this below), (7) and (8) show that, in actuality, the contrast is more general and goes beyond relational adjectives (and a particular nominal affix). Non-relational, non-derived adjectives can also resist nominalization in certain contexts:

(7) a. *une peinture abstraite*
a painting abstract
'an abstract painting'
b. *l'abstraction de cette peinture*
the.abstraction of this painting

(8) a. *un peintre abstrait*
a painter abstract
'an abstract painter'
b. **l'abstraction de ce peintre*
the.abstraction of this painter

In what follows I shall argue that the formation of deadjectival nominals is constrained in a very systematic way by the (semantic) type of the 'base' adjective, restricting them to intersective adjectives only; i.e., descriptively, to those found also in predicative positions.[3]

[3] I share with Fradin and Kerleroux (2003) the idea that the ability for an adjective to be nominalized is linked to its predicativity. As I will argue in this article, however, this is true for a wider range of adjectives than the ones they originally considered.

I will argue that this generalization finds a simple explanation if we assume a dual source for the adjective. Adjectives that can be used predicatively (henceforth, *predicative* adjective) are generated in a predicative structure (PredP), even when they appear as N-modifiers; whereas adjectives that can never be used predicatively (henceforth, *attributive* adjectives) are generated in a simple AP. Assuming a syntactic view on word formation (as in the framework of Distributed Morphology, Halle and Marantz 1993; Marantz 1997 and in Borer 2003, 2005), the nominalizing suffixes are the realization of a predicative head in the nominal domain, reducing, thereby, the class of adjectives that can form the base to a nominalization to the ones that are generated in a predicative structure only.

This analysis raises some interesting puzzles. It has been claimed for deverbal nominals that the realization of nominal arguments correlates with an event reading (cf. Grimshaw 1990), and in recent syntactic accounts, both are related to the presence of an underlying verbal structure (eventive and/or aspectual; see, for instance, Alexiadou 2001; Borer 2001). If the formation of nominals from adjectives is in any way comparable, and if all deadjectival nominals must have a predicative base, we would expect all deadjectival nominals not only to have arguments but also to have an eventuality reading. As I shall argue, however, deadjectival nominals belong to two classes with distinct properties; in particular one which does support argument structure and an eventuality interpretation and another one which, prima facie, does not.

2. (Semantic) classes of adjectives

The semantic class of the base adjective seems to play a crucial role in allowing nominalizations. Before entering into the details of the patterns of nominalizations in section 3, this section briefly reviews the traditional adjective classification based on Kamp and Partee (1995); Partee (1995) (except where noted), and my own assumptions regarding the mapping between the semantics of adjectives and their internal structure.

2.1. Intersective *vs*. non-intersective As

The first important distinction made among adjectives modifying a nominal is between *intersective* and *non-intersective* adjectives.[4] For *intersective* adjectives, the adjective-noun combination denotes an intersection between two sets. Both the adjective and the noun are one-place predicates, denoting sets; and their combination, interpreted as predicate conjunction, denotes the intersection between the two sets:[5]

(9) Intersective As
   a. ||carnivorous|| = {x | carnivorous(x)}
      ||mammal|| = {x | mammal(x)}
      ||carnivorous mammal|| = {x | carnivorous(x) & mammal(x)}
   b. ||A N|| = ||A|| ∩ ||N||

Intersective adjectives give rise to valid inferences of the type in (10):

(10) This is a carnivorous mammal
     This is a rat
     ∴ This is a carnivorous rat

Non-intersective adjectives, on the other hand comprise a variety of adjectives, including *subsective*, *adverbial* and *privative* As. With *subsective* As, the adjective-noun combination is interpreted as a subset of the set denoted by N alone. Two sub-groups are commonly distinguished: *relational* As (cf.,

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[4] As well known, many adjectives are in fact ambiguous between the two readings:
(i) *Olga is a beautiful dancer.*
   a. Olga is beautiful and she is a dancer — intersective
   b. Olga is beautiful *as* a dancer — non-intersective
(ii) *I am drinking a hot chocolate.*
   a. what I am drinking is hot and is a chocolate — intersective
   b. what I am drinking is a hot *type* of drink — non-intersective

[5] Certain intersective adjectives like *tall, big, wide* are context-dependent and vague, and must be interpreted relatively to a comparison class (e.g., *tall for a toddler* vs. *tall for a building*, etc.). They appear, then, to fail the inference test of (10). Vagueness is different, however, from non-intersectivity (cf. Kamp 1975; Siegel 1976; Kamp and Partee 1995; Larson 1999). Siegel (1976) argues, for instance, that the true non-intersective subsective adjectives occur with *as*-phrases, in English, as in *skillfull as a surgeon*, whereas vague intersective adjectives occur with *for*-phrases to indicate comparison class as in *tall for a 12-year old*.

Bally 1944; Levi 1978; Fábregas 2007): e.g., *industrial*, *atomic*, *national* (11a); and *event* modifying As (cf., Larson 1998): e.g., *good*, *skillful*, *beautiful* (11b):

(11) Subsective As:
  a. Relational As:
     Yosemite is a national park
     ≠ Yosemite is national and Yosemite is a park
     = Yosemite is a national *type* of park
  b. Event modifying As:
     Olga is a skillful surgeon
     ≠ Olga is skillful and Olga is a surgeon
     = Olga is skillful *as* a surgeon
  c. $||A\ N|| \subseteq ||N||$

For these adjectives, the semantics in (11c) holds for one N only; and inferences as in (12), below, are never valid:

(12) Olga is a skillful surgeon
     Olga is a mother
     ∴ Olga is a skillful mother [not valid]

Other adjectives are *non-subsective*. They split traditionally into two groups: 'plain' non-subsective (that have no entailments) and 'privative' non-subsective (entailing the negation of the noun property). *Plain non-subsective* adjectives are the ones Bolinger (1967); Larson (1998) call *adverbial* As: e.g., *former, alleged, future, possible, frequent*. In combination with a noun, they denote neither a set intersection nor a subset, but rather are interpreted as adverbs, at the sentence level:

(13) Adverbial As:
  a. *Craig is a former senator.*
     ≠ Craig is former and Craig is a senator
     ≠ Craig is former as a senator
     = Craig was *formerly* a senator
  b. $||A\ N|| \neq ||A|| \cap ||N||$
     $||A\ N|| \not\subset ||N||$

For *privative adjectives* (e.g., *fake, spurious, imaginary, fictitious*), the intersection of the denotation of the adjective-noun combination with the denotation of N alone gives the empty set:

(14) Privative As:

a. *This is a fake fur.*
≠ this is fake and this is a fur
= this is *not* a fur

b. ||A N|| ∩ ||N|| = Ø

I will follow Partee (2003), however, in assuming that they can be treated as intersective, once the domain of objects is extended to include fake objects.[6] Real non-subsective adjectives are adverbial only.

2.2. Predicative *vs*. attributive As

Adjectives have two well-known main uses. A *predicative* use, i.e., in construction with the copula (e.g., *this woman is sick*) or as secondary predicate inside a small clause (e.g., *we believed her sick*), and an *attributive* use, i.e., as a noun modifier (e.g., *a sick woman*).

The different classes of adjectives introduced above distribute in the two uses in a very systematic way. While all adjectives have an attributive use (cf., previous sub-section), all and only intersective adjectives have, in addition, a predicative use. Intersective adjectives are one-place predicates. They can either combine with a noun and give rise to predicate conjunction, source of the *intersective* reading; or be used predicatively and denote functions from entities to truth-values.

Unambiguously non-intersective adjectives can only be found in attributive positions and are, thus, simply ungrammatical in predicative context:

(15) a. *an utter mistake* vs. **This mistake is utter.*
b. *an alleged criminal* vs. **This criminal is alleged.*
c. *the former prime minister* vs. **The prime minister is former.*

And for adjectives that are ambiguous between an intersective and a non-intersective reading while in attributive position, only the intersective interpretation remains when used predicatively:

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[6] In actuality, Partee claims that privative adjectives are subsective. But as McNally and Boleda (2004) pointed out, her semantic analysis is intersective insofar as she treats them as simple properties, once the domain of objects is extended to include fake objects.

(16) a. *a beautiful dancer*
= 'beautiful as a dancer' non-intersective
= 'beautiful (person) and is a dancer' intersective
b. *That dancer is beautiful.* intersective only

(17) a. *a hot chocolate*
= 'a hot type of drink' (may be cold) non-intersective
= 'a chocolate and is hot' intersective
b. *My chocolate is hot.* intersective only

(18) a. *the poor child*
= 'the unfortunate child' non-intersective
= 'the moneyless child' intersective
b. *This child is poor.* intersective only

It has been claimed in recent years that certain relational, hence subsective, adjectives do have post-copular predicative uses (cf., Demonte 1999; McNally and Boleda 2004; examples adapted from McNally and Boleda 2004):

(19) a. *an international conference*
b. *This conference is international*.

This is only true, I believe, of relational adjectives that are ambiguous with an intersective reading. This is the case with the adjective *international*, which can have the two readings when in attributive context; while it is intersective only in predicative use:

(20) a. *une conférence internationale*
a conference international
'an international conference'
= 'accepts abstracts from everywhere' non-intersective
= 'people come from everywhere' intersective
b. *Cette conférence est internationale* intersective only
this conference is international

True relational adjectives can never appear in post-copular predicative contexts, as expected:

(21) a. *un bâtiment municipal* vs. **Ce bâtiment est municipal*.
a building municipal this building is municipal
'a town building'

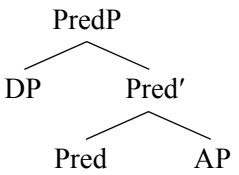
b. *une bombe atomique* vs. **Cette bombe est atomique*.
a bomb atomic this bomb is atomic
'an atomic bomb'

2.3. A structural source for intersectivity

I will assume that the mapping between predicativity and intersectivity finds its source in a structural difference between adjectives that can be used predicatively and those that are attributive only. In what follows I shall use the term "predicative" adjective to refer to adjectives that *can* be used predicatively; and the term "attributive" adjective to refer to adjectives that are *only* found in attributive contexts.

Descriptively, what distinguishes predicative adjectives from attributive adjectives is their ability to take a subject. In construction with the copula or in secondary predications, they originate inside a small clause where the predicational relationship between the adjective and its external argument is established. As in recent accounts, I will assume that all predicational relationships are mediated syntactically through the projection of a functional predicational head *Pred* (cf., Bowers 1993; Svenonius 1994; Adger and Ramchand 2003). Pred selects as its complement a property (here, an AP) and turns it into a predicate of type <e,t>. It introduces an external argument for the predicate constructed by the head and its complement. The referential DP in the specifier position of PredP is interpreted as the holder of the stative predicate thus formed:

(22)

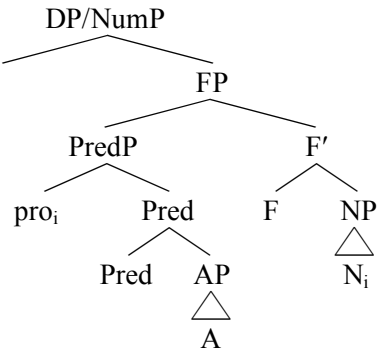


The intersective semantics of predicative adjectives is linked to the presence of the head Pred, which, I propose, is responsible for introducing a conjunction operator '∧', source of the intersective interpretation.

Following this rationale, I propose that all intersective adjectives are constructed in a PredP, not only in the clausal domain, but also when they

occur as nominal modifiers inside a nominal phrase. In that case, and abstracting away from standard issues related to the placement of pre-/post-nominal adjectives and the order of adjectives inside DP, they are selected directly by a functional nominal head inside the DP:[7]

(23)



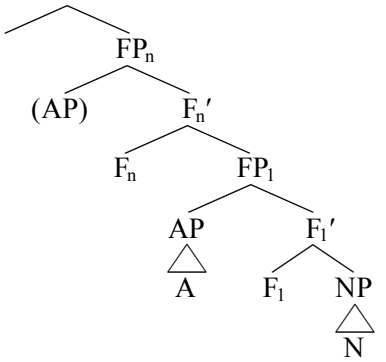
In this context, the external argument in the specifier of PredP is realized as a null proform *pro*, whose interpretation is fixed by co-indexation with the nominal head N the adjective modifies. In (23), both the AP and the NP coindexed with *pro* denote sets; Pred introduces the conjunction operator, and it is the presence of a Pred that gives rise to a set conjunction interpretation: AP $\cap$ NP.

By contrast, attributive adjectives, which can never appear as predicates, are never introduced in a PredP, but originate instead as a simple AP in the specifier of an adjective licensing functional projection within DP (as most commonly assumed; see in particular Cinque 1994):[8]

[7] The exact nature of the heads F is left undefined for the time being. It is conceivable, however, that the Fs are specific, ordered along a particular functional sequence and each select for a specific PredP or AP, as in recent accounts of adjective order and semantic ambiguity (Truswell 2004; Svenonius 2008, for instance). I leave this issue open for further investigation.

[8] On the double source for the adjective see also Siegel (1976) and more recently Alexiadou and Wilder (1998) (wrt. definiteness spreading in Greek), Demonte (1999), and Cinque (2003).

(24) DP/NumP



The non-intersective semantics of attributive adjectives is linked to the absence of Pred (and, by assumption, a conjunction operator). The subsective interpretation, however, follows from no additional assumption. As normally the case for a sequence of functional heads, the semantic output of the highest head is a subset of the head embedded below it (cf., for instance, the functional decomposition of pronouns, the functional domain of DP, and the Tense/Aspect domain). In a sequence of attributive adjectives, each is introduced as the specifier of its own, distinct, functional projection FP_1, … FP_n. Accordingly, the denotation of NP (the most embedded projection) is a subset of the denotation of the functional projection above it FP_1, which is itself a subset of FP_n: $FP_n \subseteq FP_1 \subseteq NP$.

One case remains, that of adverbial As, that are neither subsective nor intersective. Syntactically, however, I will follow Larson (1999) in assuming that they attach higher than the DP level, and presumably at the sentence-level. The non-subsective interpretation comes, here, from the particular position of these APs, outside the DP domain; and in this case as well, the non-intersective semantics correlates with the absence of a Pred head.

3. Patterns of nominalizations

Turning to the patterns of deadjectival nominalizations, I will argue that nominalizations are possible with one type of adjectives only, namely, our PredPs, but not with the other, i.e., our bare APs. This means that all adjectives that can form the base for a nominalization must have a post-copular predicative use as well, making a clear distinction between intersective adjectives, on the one hand, and the rest (i.e., subsective, whether relational or event modifying, and adverbial adjectives), on the other.

Consider, again, the pair presented in introduction and repeated below:

(25) a. (i) *une voyelle nasale*
a vowel nasal
'a nasal vowel'
(ii) *la nasalité de la voyelle*
the nasality of the vowel
b. (i) *une cavité nasale*
a cavity nasal
'a nasal cavity'
(ii) **la nasalité de la cavité*
the nasality of the cavity

The crucial difference between the use of the adjective nasal in the (a) example and the (b) example is that in the former case it is intersective, whereas in the latter it is relational and, therefore, subsective. The syntactic differences between the two classes are well-known (Bally 1944; Levi 1978; Fábregas 2007): relational adjectives do not denote gradable properties, and thus can never take degree modifiers; they cannot occur pre-nominally in Romance languages; and importantly, they do not have a predicative use.

Two distinct properties might, thus, be at play in the contrast in (25): gradability and/or predicativity. Gradability, however, must be ruled out as a blocking factor for nominalizations. This can easily be seen in the two examples in (25), above, involving both a non-gradable adjective: **une voyelle très nasale* 'a very nasal vowel'/ **une cavité très nasale* 'a very nasal cavity'; and is clearly confirmed by the contrast in (26), below. The adjective *vieux* 'old' is ambiguous between an intersective reading, where it means 'aged', and a non-intersective reading, where old modifies the actual duration of the friendship (26a). Both uses of *vieux* involve, this time, gradable properties (26b), although one only, namely the intersective one, allows for a nominalization (26c):

(26) a. *un vieil ami*
an old friend
= 'aged' or 'long time friendship'
b. *un très vieil ami*
a very old friend
= 'very aged' or 'very long friendship'
c. *la vieillesse de mon ami*
the oldness of my friend
= 'age' only

Instead, the relevant blocking property of relational adjectives as in (25) is that they do not have a predicative use, and, in our terms, are APs rather than PredPs. Only the intersective adjective *nasal* has a predicative use in addition to its attributive use (compare (27a-i) with (27b-i)), correlating with a nominal form (cf., (27a-ii) vs. (27b-ii)):

(27) a. (i) *Cette voyelle est nasale*
this vowel is nasal
(ii) *la nasalité de la voyelle*
the nasality of the vowel

b. (i) **Cette cavité est nasale*
this cavity is nasal
(ii) **la nasalité de la cavité*
the nasality of the cavity

This generalization is supported by other non-intersective (and thus non-predicative) adjectives, namely, event modifying As (cf., (28), and compare with (26)) and adverbial As (e.g., modal, as in (29); emotive, as in (30); temporal, as in (31)):[9]

(28) a. *Cet ami est vieux*
this friend is old
= 'aged' only

b. *la vieillesse de mon ami*
the oldness of my friend
= 'aged' only

(29) a. (i) *un choix possible*
a choice possible
'a possible choice'
(ii) *Ce choix est possible*
this choice is possible
(iii) *la possibilité de ce choix*
the possibility of this choice

b. (i) *un ennemi possible*
an enemy possible
'a possible enemy'

[9] Note that the noun *ancienneté* does exist in French, but means 'seniority', and is not related to the adjective *ancien* 'former'.

(ii) **Cet ennemi est possible*
this enemy is possible
(iii) **la possiblité de cet ennemi*
the possibility of this enemy

(30) a. *la pauvre enfant*
the poor child
= 'moneyless' or 'unfortunate'
b. *L'enfant est pauvre.*
the.child is poor
= 'moneyless' only
c. *la pauvreté de l'enfant*
the poverty of the.child

(31) a. *l'ancien premier ministre*
the.former prime minister
b. **Le premier ministre est ancien.*
the prime minister is former
c. **l'ancienneté du premier ministre*
the.former$_{.N}$ of.the prime minister

Nominalizations of privative adjectives are also allowed. This is clearly what is expected, however, since they are PredPs and can be used predicatively as well:[10]

(32) a. *une fausse fourrure*
a fake fur
b. *Cette fourrure est fausse.*
this fur is fake
c. *la fausseté de cette fourrure*
the fakeness of this fur

As already suggested by example (26), above, the generalization holds independently of a particular nominalizing suffix; consider, for instance, the suffixes *-(a)tion*, *-isme* and *-eur*, respectively below:

[10] A certain variation in the degree of acceptability of (32b) exists among French speakers. Note, however, that for speakers that judge the predicative use of a privative adjective ungrammatical, the impossibility to form (32b) correlates with the ungrammaticality of (32c) as well, as expected.

(33) a. (i) *une peinture abstraite*
a painting abstract
'an abstract painting'

(ii) *Cette peinture est abstraite*
this painting is abstract

(iii) *l'abstraction de cette peinture*
the.abstraction of this painting

b. (i) *un peintre abstrait*
a painter abstract
'an abstract painter'

(ii) **Ce peintre est abstrait.*
this painter is abstract

(iii) **l'abstraction de ce peintre*
the.abstraction of this painter

(34) a. (i) *une réaction paternelle*
a reaction paternal
'a paternal reaction'

(ii) *Sa réaction est paternelle.*
his reaction is paternal

(iii) *le paternalisme de sa réaction*
the paternalism of his reaction

b. (i) *l'autorité paternelle*
the.authority paternal
'paternal authority'

(ii) **Son autorité est paternelle.*
his authority is paternal [w/ the relevant reading]

(iii) **le paternalisme de son autorité*
the paternalism of his authority

(35) a. (i) *un bain chaud*
a bath hot
'a hot bath'

(ii) *Mon bain est chaud.*
my bath is hot

(iii) *la chaleur de mon bain*
the heat of my bath

b. (i) *un chocolat chaud*
a chocolate hot
'a hot chocolate'
(ii) **Mon chocolat est chaud.*
my chocolate is hot [w/ the relevant reading]
(iii) **la chaleur de mon chocolat*
the heat of my chocolate

Finally, the ungrammaticality of the nominals compared to the grammaticality of the predicative phrases involving the related adjective, in (36), below, serves to emphasize that while all adjectives that function as a base for a nominalization must be a PredP, not all PredP necessarily have a nominal associated:

(36) *ce roi est juste* ; **la justesse de ce roi*
this king is just the just.$_N$ of this king

While the noun *justesse*, which seems to be derived from *juste*- plus the nominal suffix -*esse*, does exist in French, it means something like 'accuracy', 'rightness' (cf., *la justesse de cette remarque* 'the rightness of this remark'). It is an accidental lexical gap that no noun derived from the adjective *juste* meaning 'just' (and presumably related to the concept of justice) can be found in French.

4. Ambiguity in deadjectival nominalizations

The core issue that our theory of nominalization must explain is why only PredP adjectives can nominalize while simple APs cannot. This seems to suggest that nominal affixes cannot attach to APs directly, but need, for a reason to be explained, a PredP. Another issue adds to the first one. So far, I have discussed deadjectival nominals as if they belong to a unified class. This is, however, not the case, and at least two classes must be distinguished that I will name *state-nominals* (*S*-nominals) and *quality-nominals* (*Q*-nominals), respectively. The two interpretations are illustrated by the ambiguous noun *popularité* 'popularity', below, which can either describe a state of being popular (37a), or name the quality that one or something may possess (37b):

(37) a. *La popularité de ses chansons m'impressionne.*
the popularity of his songs me.impresses
'The popularity of his songs impresses me.'

b. *La popularité est une qualité qui lui fait défaut.*
the popularity is a quality that to.him does default
'Popularity is a quality that he is lacking.'

In a syntactic view of word formation, their differences must be captured structurally as well, in such a way that our analysis can only be satisfactory if it also allows us to explain the particularities of the two classes of nominalizations. I will, thus, first introduce the properties of the two classes of deadjectival nouns, and then turn to a proposal regarding their internal structure.

In her very influential work on deverbal nominalizations, Grimshaw (1990) diagnoses two types of deverbal nominals, complex event nominals (e.g., *the (frequent) examination of the students*) and result nominals (e.g., *the examination/exam was on the table*), which have the properties in (38), respectively:

(38) a. *Complex event* nominals:
(i) Event reading
(ii) Obligatory arguments
(iii) Agent-oriented modifiers
(iv) Implicit argument control
(v) Compatible with aspectual modifiers like *in three hours*
(vi) Modifiers like *frequent*, *constant* only with singular
(vii) *by*-phrases are arguments
(viii) Must be singular
(ix) Must be definite

b. *Result* nominals:
(i) No event reading
(ii) No obligatory arguments
(iii) No agent oriented modifiers
(iv) No implicit argument control
(v) Not compatible with aspectual modifiers
(vi) Modifiers like *frequent*, *constant* with plural
(vii) *by*-phrases are not arguments
(viii) May be plural
(ix) May be indefinite

Where applicable, I shall use the same tests to show that the semantic divide between *S*-nominals and *Q*-nominals correlates, in surface at least, with similar types of differences. The first important difference relates to the obligatory realization of an overt external argument. *S*-nominals must always have an overt holder argument, in the form of a *de*-phrase in French. In (37a) above, *ses chansons* 'his songs' expresses the holder of the state described by the nominal *popularité*. *Q*-nominals, on the other hand, must appear without an overt external argument. The absence of a *de*-phrase in (37b) can only give rise to the quality reading.

Second, while *S*-nominals can be modified by aspectual adjectives expressing, for instance, frequency (e.g., *constant* 'constant'), manner (e.g., *rapide* 'fast'), or modality (e.g., *possible* 'possible'), *Q*-nominals resist systematically such modifications. Consider (39), below. The presence of the adjective *constante* forces the realization of the external argument: when *constante* is present the *de*-phrase cannot be dropped (39a); and when no external argument is realized, *constante* cannot be inserted (39b). The same point is further illustrated with a transitive adjective in (40):[11]

(39) a. *La popularité constante *(de ses chansons) m'impressionne.*
the popularity constant of his songs me.impresses

b. *La popularité (*constante) est une qualité qui lui fait défaut.*
the popularity constant is a quality that to.him does default

(40) a. *la fierté constante *(de Jean) *(pour son travail)*
the pride constant of John for his work
'John's constant pride for his work'

b. *La fierté (*constante) l'aveugle.*
the pride constant him.blinds
'Pride blinds him.'

Third, while the obligatory *de*-phrase appearing with a *S*-nominal must be interpreted as a subject, *Q*-nominals may sometimes take an overt *de*-phrase,

---

[11] French, and Romance languages more generally, disallow a double *de*-phrase (subject/object). The object is, accordingly, generally introduced by a full preposition. This is apparently not the case in English, which allows, for some speakers at least, *of*-objects:

(i) a. *la folie de Tom (*de) / pour les films*
the crazyness of Tom of for the movies

b. *Tom's fondness of music*

but in that case it can only be interpreted either as an object (41) or as a possessive (i.e., as a quality attributed to an individual) (42):

(41) *l'ivresse de la vitesse*
the.drunkenness of the speed
'the intoxication by speed'

(42) *La fierté de Jean l'aveugle*.
the pride of John him.blinds
'John's pride blinds him.'

Modification by *constant(e)* of a *Q*-nominal accompanied by an object or a possessive *de*-phrase is significantly degraded, as expected:

(43) a. *l'ivresse (*?constante) de la vitesse*
the.drunkenness constant of the speed
'the (constant) intoxication by speed'

b. *La fierté (*?constante) de Jean l'aveugle*.
the pride constant of John him.blinds
'John's (constant) pride blinds him.'

Finally, while in French both a *S*-nominal and a *Q*-nominal must be constructed with an article, a further contrast appears in English where only *Q*-nominals can appear bare:

(44) a. **(The) popularity of his songs impresses me*.
b. *Popularity is a quality that he is lacking.*

Q-nominals name abstract concepts (e.g., *popularity*, *abstraction*, *redness*, etc.) and behave like mass rather than count terms, and, thus, cannot generally take the plural, neither in French nor English:[12]

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[12] Some exceptions do exist in French but are rather limited; see for instance (i). Other, more common, cases of plural deadjectival *Q*-nominals are 'occurrence'-Ns, where the plural designates a plurality of happenings rather than a real plurality of objects (ii):

(i) a. *Tu as une rougeur sur la joue*.
you have a redness on the cheek
'You have a red spot/mark on your cheek.'

b. *Il y avait trois saletés sur la table.*
there.was three dirty.$_N$ on the table
'There was three pieces of dirt on the table.' …

(45) **Les popularités sont des qualités qui leur font défaut.*
the.PL popularity.PL are a.PL quality.PL that to.them do default

That these nouns are mass explains straightforwardly the distribution of the articles in English, and in particular the fact noted earlier that they can appear as bare singulars (44b).

The distinctive properties of *S*-nominals and *Q*-nominals discussed here are summarized in (46):

(46) a. *S*-nominals
(i) State reading
(ii) Obligatory (overt) external argument
(iii) *constant*, *rapide,* etc. modification possible
(iv) *de*-phrase is an argument
(v) Must appear with an article in both French and English

b. *Q*-nominals
(i) Quality reading
(ii) No apparent external argument
(iii) *constant*, *rapide,* etc. modification not possible
(iv) *de*-phrase is not an argument
(v) Can be bare in English (but not in French)

The important correlation between event reading and obligatory argument structure that has long been made for deverbal nouns seems to hold for deadjectival ones as well. In view of the similar properties of *S*-nominals and complex event nominals (both have obligatory argument structure (or at least external argument in the case of deadjectival Ns), correlating with an eventuality reading, and both can take *constant* modification (with singulars)), it is important to emphasize that obligatory argument structure in derived nominals correlates not necessarily with a "process"/"event" reading,

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(ii) a. *Ils ont refusé ses largesses*.
they have refused his largesses
'They refused his largesses.'

b. *Elle a commis quelques indiscrétions par le passé.*
she has committed few indiscretions by the past
'She committed a few indiscretions in the past.'

c. *Il était connu pour ses infidélités.*
he was known for his infidelities
'He was known for his infidelities.'

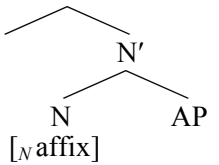
but with an "eventuality" interpretation more generally, including clear "states" (our *S*-nominals). Furthermore, an eventuality reading and obligatory argument structure do not necessarily map with an underlying verbal/aspectual structure for eventuality-nominals either. What it necessarily correlates with, however, is the presence of a predicative structure. Argument supporting nominalizations always involve a predicative basis, may it be verbal (*destruction*, *examination*) or adjectival (*redness*, *awareness*; in my terms a PredP).[13]

5. Internal structure of *S*-nominals and *Q*-nominals

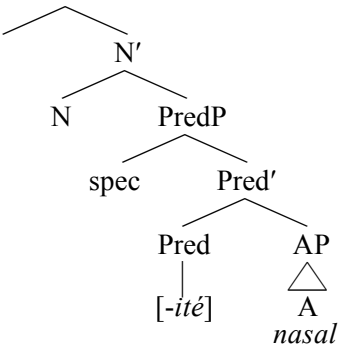
5.1. A proposal

I propose that the reason nominal affixes can only attach to adjectives constructed with a Pred head is because such affixes are the realization of the head Pred itself. In other words, nominal affixes such as *ité*, *eur*, *(a)tion*, *esse*, and so on, are not hosted by a categorical head N directly (47), but project instead as a functional head, namely Pred, which takes a simple AP as its complement, as in (48):[14]

(47)



(48)



Deadjectival nominalizations are created when PredP is embedded under an NP, and the head Pred raises to N in order, I assume, to check its nominal-features. As commonly the case in Distributed Morphology, the morpho-

[13] And even prepositional; cf. the English *aboutness*; no such examples exist in French however.

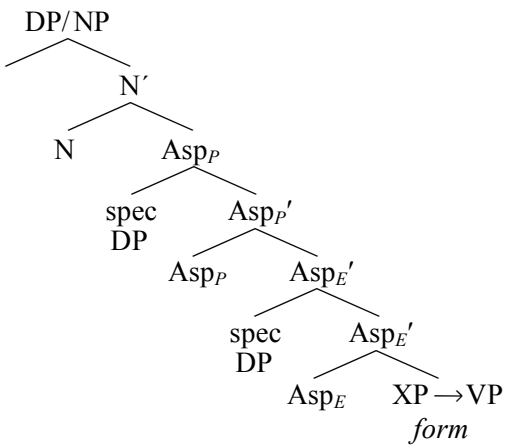
[14] In the domain of deverbal nominals, Borer (2001, 2003) has claimed that both structures are in fact attested. More on this below.

logical realization of Pred is determined by its syntactic environment. Whereas it is generally a null head in the clausal domain (null head of the small clause; but see, for instance, Adger and Ramchand 2003), it is realized as a nominal morpheme in nominal context, i.e., when dominated by a DP/NP. In both cases, however, Pred is the same head.

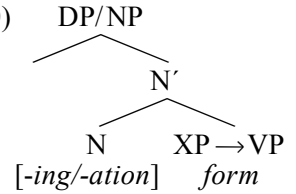
This proposal makes an immediate prediction regarding the argument structure of deadjectival nominals. Since all deadjectival nominals must involve a Pred head, and the role of Pred, as stated earlier, is to introduce an external argument, all deadjectival nominals must support an external argument. A priori, however, the prediction is not met for *Q*-nominals; cf., section 4, above.

In recent syntactic approaches to complex event nominals it has been proposed that argument structure and event interpretation are tightly related through the projection of functional nodes typically found in verbal clauses and linked to an event interpretation (cf., Alexiadou 2001; Borer 2001, 2003, in particular). All differences aside, in both types of accounts, it is the presence of "verbalizing" functional event structure (for Alexiadou 2001, VoiceP/AspectP; for Borer 2001, 2003, EventP/AspectQP) in these nominals that is responsible for introducing the arguments and for the event reading. By opposition, in result nominals it is precisely the absence of such functional layers that yields to a non-eventive interpretation and the absence of arguments. Result nominals are simply derived from the presence of a nominal structure directly above a (category neutral) lexical item (for Alexiadou, a root LP which may have internal arguments; for Borer an encyclopedic item *EI*, projected within the *conceptual array* and which cannot in and of itself have arguments.). Compare (49) with (50) (as executed in Borer 2001):

(49)

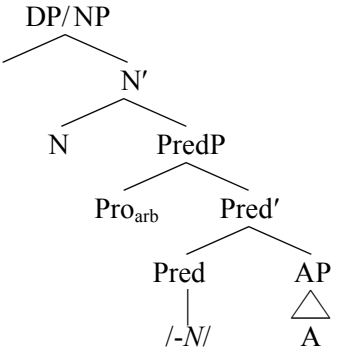


(50)



The situation for deadjectival nominals is quite different. The contrast between *S*-nominals and *Q*-nominals does not reside in the absence *vs*. presence of an argument licensing head, but instead in how the external argument, by assumption always there, is realized. With *S*-nominals it is realized as an overt DP. With *Q*-nominals, however, the external argument is realized by a null argument. More concretely, I propose that this head is a null proform (presumably the same null element also found with predicative adjectives when they modify a noun, cf., (23) above) *pro*/PRO, which in the absence of coindexation with an antecedent (i.e., contrary to (23)), receives an arbitrary reference:

(51)



Note that the meaning of the null argument in (51) differs, however, from that of a regular PRO$_{arb}$ in the sense that it is not restricted to animates/humans but can also be inanimate. While it is true that, when uttered out of the blue, there is a strong tendency to interpret the implicit argument of a *Q*-nominal as animate/human; cf., *la popularité* 'popularity', *la fragilité* 'fragility', *la pâleur* 'palness', *la faiblesse* 'weakness', in actuality, all these nouns are easily attributable to inanimate subjects, along with, for instance, *la longueur* 'length', *la blancheur* 'whiteness', *la dangerosité* 'dangerosity', *la rapidité* 'rapidity', and so on. So, this null argument is more on a par with instances of null pronominal arguments of the type illustrated in (52):

(52) *Un arrosage quotidien peut conduire les feuilles à [PRO*
a watering daily can lead the leaves to
jaunir rapidement]
become.yellow rapidly
'Daily watering could lead the leaves to become yellow quickly.'

In other words, *Q*-nominals have an argument structure, it is just not realized overtly. What this means, concretely, is that *Q*-nominals are inherently 'relational' nouns. Like other relational nouns, e.g., kinship nouns (*sister*) and nouns with inherent part-whole relations (*the chair's arm*), *Q*-nominals like *lenteur* 'slowness', *gentillesse* 'kindness', *abstraction* 'abstraction', *amplitude* 'amplitude', etc. necessarily involve a relation to an implicit argument. Here the relationship between structure and interpretation is a straightforward one as the implicit argument has a direct structural source, in the form of the null PRO sitting in spec-PredP.

Morphology seems to support the claim that both *S*-nominals and *Q*-nominals involve the same nominalizing head. Independently of their nominal suffix, all deadjectival nominals are ambiguous between a *S*-nominal and a *Q*-nominal. This ambiguity follows from our account without positing an ambiguity at the level of the nominalizing heads themselves.[15]

5.2. More on the 'quality' reading

More needs to be said about the 'quality' interpretation of *Q*-nominals. The issue is not trivial, as under our view Pred introduces a state, and its presence should therefore give rise to a state reading for all deadjectival nouns, including *Q*-nominals, cf., section 4. I suggest that the 'quality' interpretation is not the result of absence of eventuality altogether, but rather is obtained through the arbitrary reading of Pro and generic quantification using mechanisms mirroring exactly that found in the clausal domain. It has been noted that arbitrary reference in the clause is tied to genericity (Bhatt and Pancheva 2006; Moltmann 2006, for instance). The arbitrary interpretation is only available in generic environments. In episodic environments, the 'uncontrolled' PRO picks its interpretation from the local context:

[15] The situation is rather different with deverbal nouns for which the form of the suffix is commonly assumed to play a role in determining whether they have an event reading, or not; such that *ø*-suffixation gives rise to a referential reading only, *-ing* to an event reading only and *-(a)tion* is ambiguous (Grimshaw 1990).

(53) a. *It is great [PRO$_{arb}$ to see the sun] again.*
b. *This morning, it was difficult [PRO to see the sun] because the moving clouds kept obstructing the view from the window.*

Accordingly, and as pointed out by Bhatt and Pancheva (2006), the arbitrary nature of PRO*arb* does not need to be stipulated. Instead, they propose that the 'quantificational' force comes from the presence of genericity. The implicit argument receives arbitrary reference when it is bound by a generic operator (GEN) higher in the clause. If there is no GEN, PRO picks its reference from the context.

Assuming that the arbitrary reference is always obtained under control by a GEN operator, even when it appears inside the DP domain, the PRO in *Q*-nominals must be bound by a GEN operator as well. The direct implication is that *Q*-nominals have a generic force. In other words, what I have called the 'quality' interpretation is in actuality a generic interpretation, making *Q*-nominals generic, property referring, terms.

Evidence that *Q*-nominals are generic terms come from the type of adjectival modification they are compatible with. With *Q*-nominals, the adjective-noun combination can only denote a sub-type of the denotation of N alone. Hence, for instance, *jalousie délirante* is possible because it is a type of jealousy; while the (b) examples are not:[16]

(54) a. *La jalousie délirante est un syndrome psychiatrique commun.*
the jealousy delirious is a syndrome psychiatric common
'Delusional jealousy is a common psychiatric syndrome.'
b. *La/L'(*longue/ *triste) jalousie (*intense/ *profonde) a ses symptômes.*
the long sad jealousy intense deep has its symptoms

[16] It is possible that a certain cross-linguistic variation exists regarding what type of A-N combination counts as a type of N. Taking as a test for *Q*-nominals their ability to occur in predicative constructions of the type *N is a symptom of* / *is a flaw* / *is a quality that he is lacking*, it seems that while *jalousie intense*, for instance, is not a *Q*-nominal in French (ia), its English counterpart *intense jealousy* might behave like one (ib):
(i) a. **La jalousie intense est un défaut.*
the jealousy intense is a flaw
b. Intense jealousy is a flaw.

Turning to the restrictions on aspectual adjective modification discussed in section 4, it appears, thus, that it does not bear on the contrast between eventuality-related modifiers *vs*. not eventuality-related modifiers, but rather on whether or not the adjective is compatible with a generic interpretation for *Q*-nominals. In particular, while *Q*-nominals cannot be modified by 'constant', 'possible', 'frequent', and so on, they are nonetheless compatible with certain adverb-like adjectives, under the condition that they modify a type of N (55). In this case, all sorts of modifiers are possible, including manner and temporal ones:

(55) a. *fragilité psychologique*
fragility psychological
'mental frailness'

b. *industrialisme sauvage*
industrialism wild
'illegal industrialism'

c. *jeunesse éternelle*
youth eternal
'eternal youth'

The restriction is, thus, independent of the presence of an underlying event/state.

5.3. Deadjectival *vs*. deverbal nominals

While *S*-nominals share obvious properties with complex event nominals, *Q*-nominals and result nominals are very different entities. *Q*-nominals are relational, property referring terms. They behave like mass rather than count. Result nominals are count terms and name concrete objects. For result nominals, the absence of argument structure, eventuality reading and the impossibility to be modified by 'constant' are the result of the absence of verbal/aspectual projections altogether (Alexiadou 2001; Borer 2001, 2003; cf. (50), above). For *Q*-nominals these properties result from genericity. Despite superficial similarities, their internal structures are very different and correlate with the noted semantic differences.

A legitimate question remains, however. Why is there no 'result' nominal formed with an adjective? In other words, why is it not possible to simply insert syntactically an AP as complement of a head N, as in (47), above, in light, specifically of the existence of (50)?

The ungrammaticality of APs in the complement position of a head N in (47), compared to the grammaticality of VPs in such context (cf., (50)) leads to the conclusion that VPs and APs are not only categorially different, but must be distinct semantic objects as well.

Assuming that only predicates can be embedded under a nominalizing structure, I suggest that the reason it is possible to insert a VP directly under a nominal projection, but not an AP, is because, whereas VPs are predicates, APs in and of themselves are not. An AP is property denoting, and becomes a predicate when it is introduced by a head Pred in a PredP construction, which, crucially, can appear under a nominalizing structure.

This result inside the structure of nominals mirrors exactly what has been noted for a long time in the clausal domain. There as well, APs cannot function directly as predicates. Whereas verbs can appear by themselves in a clause with a subject, adjectives (and for that matter, all other non-verbal predicates as well) require an additional element, i.e., most commonly a copula or a particle, in order to function as a direct predicate.

6. Conclusion

I have shown in this paper that the important correlation between eventuality reading and argument structure noted for deverbal nominals is preserved for deadjectival nominals as well. In this context, the existence of *S*-nominals is unproblematic, given the generalization that deadjectival nominals can only be formed from predicative adjectives, i.e. PredPs. The apparent conflict between the fact that all deadjectival nominals involve a predicative adjective (and therefore a Pred head) and the existence of *Q*-nominals, however, can be easily resolved by a single assumption, namely that *Q*-nominals involve a PRO argument. Other properties, as the apparent absence of eventuality reading, derive from mechanisms otherwise needed in the clausal domain (i.e., assignation of arbitrary reading with genericity). Finally, the impossibility to form true "result nominals" from adjectives is explained straightforwardly by a well-known difference between As and Vs, namely that only the latter can function directly as predicates. Here again, the internal syntax of complex nominals mirrors that of the clause.

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Event-structure constraints on nominalization

Ivy Sichel

1. Deficiency in nominalization

Nominalization structures are in some sense 'deficient' when compared with their verbal counterparts. One particularly well-known difference found in languages like English, where external arguments are obligatorily realized in clauses, is that the overt realization of the external argument is not necessary (Abney 1987; Dowty 1989; Kratzer 1996; Alexiadou 2001; among others). Nominalizations also appear to lack the OBJ grammatical function or the structural space often attributed to an extended VP (Rappaport 1983; Kayne 1984; Abney 1987): ECM, double objects, object control, and particle shift have been claimed to require VP shell-structure or Agr-o (Larson 1988, 1990; Den Dikken 1995; Collins and Thrainsson 1996; Svenonius 1996). These constructions are all lacking in derived nominals and in ING-OF gerunds, though available in the POSS-ING variety:[1]

(1) a. *John's belief / believing of [Bill to be Caesar] ECM
b. John's believing [Bill to be Caesar]

(2) a. *John's gift / rental / giving (of) Mary of a fiat Double objects
b. John's giving / renting Mary a fiat

(3) a. *John's persuasion / persuading of Mary [PRO to stay] Object-
b. John's persuading Mary [PRO to stay] Control

(4) a. *John's explanation (away) of the problem (away) Particle-Shift
b. John's explaining (away) of the problem (*away)
c. John's explaining (away) the problem (away)

The goal of the paper is to provide a preliminary delineation of the particular sense or senses in which nominalization and derived nominals are deficient. It is feasible, of course, that more than one sort of deficiency is in-

[1] The term Nominalization, in what follows, refers to both derived nominals (nominalizations with unpredictable affixes, such as -ation/-ment/-ance/-al) and ING-OF gerunds.

volved. Depending on the ultimate analysis of the optionality of the external argument, as a syntactic, EPP-related, effect, or as related to argument structure and the non-argument status of external arguments in nominalization, optionality may be independent, or partially independent, of the deficiency observed in (1–4). On an EPP approach to external argument optionality, this property may be related to cross-categorial differences in the relatively high functional structure associated with clauses, whereas (1–4) might be related to the lower functional domain often associated with direct object licensing. Similarly, the deficiency in (1–4) may have more than one source. The literature on VP-structure has attributed these constructions to functional structure, suggesting that there are no nominal counterparts to the morpho-syntax introduced by Agr-o, vP, or VP-shells. On an earlier, LFG proposal, nominalizations lack the OBJ grammatical function (Rappaport 1983). More recently, however, the class of direct objects has been divided into those associated with activities and those associated with accomplishments (Levin 1999; Rapoport 1999; Ramchand 2007; Folli and Harley 2008), raising the possibility that not all types of direct objects are missing in nominalization but only a subset, as defined by the structure of events. If so, at least part of the deficiency observed in nominalization may ultimately reduce to deficiency in the kinds of events compatible with nominalization. To the extent, though, that event-structure is encoded syntactically (Borer 2005; Ramchand 2007), a morpho-syntactic analysis and an event-related analysis are not incompatible.

Here I will argue that in addition to pure morpho-syntactic deficiency, derived nominals in English are also deficient in the sort of events they can host and are restricted to simple, single events. They contrast, in this respect, with ING-OF nominalizations, which are similarly deficient in their range of purely morpho-syntactic projections, but are not constrained in terms of the kinds of events they can host. A glimpse of the difference can be seen in (4): while both derived nominals and ING-OF gerunds exclude particle-shift, the particle is possible without shifting in ING-OF gerunds but not in derived nominals (Harley and Noyer 1998; Harley 2008). Taking particles to add an end-point or result component to an activity (Ramchand and Svenonius 2002 among others), this suggests that ING-OF gerunds may denote complex events while derived nominals may not. Particle shift, from this perspective, would require additional morpho-syntactic structure, necessary also for (1)–(3) and equally lacking in both forms.

In what follows, I will assume a shared, purely morpho-syntactic deficiency for both nominalization types and focus on the differences between them. More specifically, I will argue that English derived nominals are re-

stricted to single, simple, events, while ING-OF gerunds can also host complex events, in particular, lexical causatives and augmented events of various types.

To the extent that event-structure constraints are active in nominalization, we gain new ground for the study of the event-syntax interface. If the above hypothesis is on the right track, it might move us closer to understanding what licenses complex events. Since both ING-OF gerunds and derived nominals are syntactically deficient and only the former can host complex events, the comparison of the two nominalizations is likely to define the theoretical space within which the ingredients licensing complex events are located.

The central argument for event simplicity proceeds from the observation that certain kinds of external arguments are impossible in the derived nominal counterparts to lexical causatives (Pesetsky 1995; Marantz 1997; Harley and Noyer 2000; Alexiadou and Schäfer 2006). For expository purposes and somewhat misleadingly, I call the restriction 'Agent exclusivity', and show that the interpretive effect is present with both overt and covert external arguments. It is argued that the effect is to be attributed to a general restriction against event complexity rather then to a restriction against particular non-agentive thematic roles. On thematic-based accounts (Marantz 1997; Harley and Noyer 2000; Alexiadou and Schäfer 2007) the restriction to agentivity is encoded at the level of the root, and I discuss some difficulties for root-level representation of agentivity for all potentially transitive roots. Event complexity is defined in terms of temporality and not agentivity per se: in a simple event, the participation of the instigating agent must be co-temporal with the beginning of the unfolding event. Since the class of co-temporal instigators can include a variety of non-animates, it cannot be restricted to agents if 'agent' is understood solely in terms of the properties associated with humans (intentionality and volition). Furthermore, the constraint against non-co-temporal instigators is shown to be just one instantiation of the restriction to simple events. Restrictions in nominal passive may also be understood in terms of event simplicity, though in this case it is the result sub-event which is realized. The restriction to a particular event size should be neutral with respect to event type, and indeed any kind of event is allowed, activity-like or achievement-like, as long as it is simple. The paper is organized as follows. Section 2 introduces agent exclusivity in English and Hebrew. Section 3 defines the relevant notion of agency in temporal terms leading to event-identification and the restriction to single, simple, events. Section 4 suggests that restrictions on nominal passive in English be similarly understood as just another case of event simplicity in derived nominals. Section 5 turns to ING-OF gerunds and shows that here no such

event restrictions are observed. Section 6 concludes with some preliminary speculations on the relationship between the temporal properties of ING-OF gerunds and the licensing of an additional event variable, necessary for complex events.

2. Agent exclusivity

Preliminary indication of a systematic exclusion of a class of CAUSE arguments in the pre-nominal genitive is provided by a correlation between grammatical and ungrammatical transitive nominalizations and alternating and non-alternating verbal causatives. Pesetsky (1995) observes that in English, causatives that don't alternate produce grammatical transitive derived nominals, but verbs which occur in the inchoative/causative alternation don't produce transitive derived nominals, in (7).

(6) a. Bill's cultivation of the tomatoes
Bill cultivated the tomatoes / *The tomatoes cultivated
b. The bomb's destruction of the town
The bomb destroyed the town / *The town destroyed
c. The volcano's fortuitous burial of Herculaneum
The volcano buried Herculaneum / *Herculaneum buried
d. The emperor's restoration of the monarchy
The emperor restored the monarchy / *The monarchy restored
e. the proposal's creation of controversy
The proposal created controversy / *Controversy created
f. the sun's illumination of the room
The sun illuminated the room / *The room illuminated
g. Bill's discontinuation / suspension of the activity
Bill discontinued the activity / *The activity discontinued

(7) a. *Bill's growth of tomatoes
Bill grew tomatoes / Tomatoes grew
b. *The mechanism's drop of the curtain
The mechanism dropped the curtain / The curtain dropped
c. *The thief's return of the money
The thief returned the money / The money returned
d. *Inflation's shrinkage of his salary
Inflation shrunk his salary / His salary shrunk

e. *Inflation's diminishment of his salary
Inflation diminished his salary / His salary diminished
f. *Gravity's swing of the pendulum
Gravity swung the pendulum / The pendulum swung
g. *The bow's vibration of the string
The bow vibrated the string / The string vibrated
h. *Bill's cessation / stoppage of the activity
Bill stopped the activity / The activity stopped

Pesetsky (1995) argues that the problem in (7) is related to the morphology of the verbal alternation and suggests that zero-derived forms cannot nominalize. In the spirit of Chomsky (1970), Marantz (1997) capitalizes on the correlation between alternating and non-alternating causatives and the roots they are derived from, and arrives at the conclusion that (6–7) support the direct derivation of nominalizations from a category-neutral root. Following the typology developed in Levin and Rappaport (1995), Marantz (1997) argues that non-alternating verbs are based on roots which imply external causation, and alternating verbs imply internal causation. The external argument associated with the latter must be introduced by a separate head in an extended vP. But since the external argument in the former class is implied by the root, it may also be expressed by a pre-nominal genitive. The absence of derived nominals based on alternating causatives shows, from this perspective, that nominalization proceeds directly from a category-neutral root and that vP does not nominalize. This analysis of the restriction on transitive derived nominals can be characterized as lexical since it draws the division at the level of the root, between those that imply external causation and those which do not.

The morphological account in Pesetsky (1995) and the lexical account in Marantz (1997) share the intuition that the restriction in nominalization directly correlates with the causative typology in verbs. This generalization is disputed in Harley and Noyer (2000), where alternating verbs are presented which *do* produce transitive derived nominals. They claim that transitive nominals derived from alternating verbs are possible as long as the external argument can be construed as a direct cause, in the (b) examples:

(8) a. The balloon exploded / the balloon's explosion
b. The army exploded the bridge / the army's explosion of the bridge

(9) a. Wealth accumulated / the wealth's accumulation
b. John accumulated wealth / John's accumulation of wealth

(10) a. Jim and Tammy Faye separated / Jim and Tammy Faye's separation
b. The teacher separated the children / The teacher's separation of the children

(11) a. The German principalities unified / the principalities' unification
b. Bismarck unified the German principalities / Bismarck's unification of the German principalities

The possibility of transitive derived nominals based on alternating verbs highlights the significance of the construal of the external argument. Since non-alternating causatives are based on roots of external causation to begin with, they are expected to produce transitive derived nominals, whereas nominalization of alternating causatives depends on the possibility for external causation (available for 'unify', 'separate', but not 'grow') and the perception of a particular token event as externally caused (Harley and Noyer 2000). The direct cause construal may be affected by particular choices of THEMES and CAUSES. In the impossible nominalizations below, the pre-nominal genitive cannot be so construed. 'John' in (12c) would typically be construed as a possessor, and not as the agent of accumulation, as it could in (9b). 'Adultery', 'the cold war', and 'the 19th century' in (13) are typically construed as facilitators, on a par with the subject of 'growth' (from Harley and Noyer 2000).

(12) a. Dust accumulated on the table
b. the accumulation of dust on the table
c. #John's accumulation of dust on the table

(13) a. Adultery separated Jim and Tammy Faye
b. #Adultery's separation of Jim and Tammy Faye
c. The cold war separated E. and W. Germany
d. #The cold war's separation of E. and W. Germany
e. The 19th century unified the principalities
f. #the 19th century's unification of the principalities

Harley and Noyer leave open the nature of the division between external causes and the facilitators in (13). Wolff (2003) defines 'direct cause' in terms of event proximity. A direct cause is the most proximate event in the causal chain leading to the event denoted by the head of the phrase, and this seems sufficient to rule out the bad cases in (13). 'Adultery', 'the cold war' and 'the 19th century' denote macro-events or time spans which are too broad to qualify as direct causes of the events denoted by these derived

nominals. Since the acceptability of transitive derived nominals does not align with the typology of causative verbs, the possibility of external causation, according to Harley and Noyer (2000), must be part of our encyclopedic knowledge about all roots and the events they potentially denote. In addition, the pre-nominal genitive must be construed as a direct cause. Encyclopedic knowledge, on this account, is distinct from the grammatical division which separates alternating and non-alternating verbs, and all that is required is that the meaning of the root be compatible with external causation. The requirement for external causation, however, is neutral with respect to the kind of causation, so it appears that a further requirement for *direct* causation is imposed by specDP. This is especially surprising in nominals derived from alternating verbs, where the verbal form is not so restricted (in (13)). More generally, Levin and Rappaport (1995) and Reinhart (2002) have shown that the subject of alternating verbs is less restricted than the subject of non-alternating verbs. Non-alternating causatives have necessarily agentive subjects, in (14), but where the inchoative is available, the transitive subject need not be agentive, in (15).

(14) a. Carla humidified her apartment
b. *The weather humidified her apartment
c. *Her apartment humidified

(15) a. The cook caramelized the sugar
b. The intense heat caramelized the sugar
c. The sugar caramelized

The question regarding the source of the restriction to direct causes does not arise as acutely for nominals derived from non-alternating verbs, since here the external argument is a direct cause to begin with (in (14)).

Alexiadou and Schäfer (2006) relate the requirement for direct causation to agentivity. They argue that agents are privileged when it comes to encyclopedic knowledge, and that agentivity is given by encyclopedic knowledge associated with the root. Having agentivity associated with the root accounts more directly for the restriction to direct causation. Beyond that, it shares with Harley and Noyer (2000) the idea that meaning ingredients associated with the external argument (external causation, direct causation, agentivity) are part of the conceptual structure of all potentially transitive roots, including alternating verbs such as ‘explode’, ‘separate’, ‘unify’. The empirical price is that on their verbal inchoative use there is no implication of a CAUSE at all. But if external causation or agentivity are associated with all potentially transitive roots, it is no longer clear how to preserve the dis-

tinction between alternating and non-alternating verbs and how it is represented. If the nominal paradigm is to be accounted for without compromising the verbal paradigm it seems that the restriction to agentivity should be encoded above the level of the root, at a level which is specific to nominals, possibly as a selectional restriction associated with nominalizing affixes.

These proposals raise a number of important issues which the present analysis attempts to resolve. What is the notion of agency or direct causation relevant for derived nominals? Agency has sometimes been defined solely in terms of the properties associated with the participant: rational, intentional, volitional. It has also been claimed to arise as an implicature, never linguistically encoded as such (Van Valin and Wilkins 1993). Harley and Noyer's insight that whether the pre-nominal genitive qualifies as a direct cause is a function of the denotation of the root combined with the denotation of the participants appears to go against the spirit of a lexical, root-based, analysis, and hinges on the nature of the event as a whole, the root and the participants. The relation to event-structure is developed and made explicit in section 3, where it is claimed that the empirical generalization involves event co-temporality, and not agentivity *per se* (if agentivity is defined solely in terms of properties of the participant). As discussed in more detail in section 3, derived nominals are limited to simple, single, events and the external argument must be interpreted as a direct participant, a class which includes agents and a variety of inanimate forces, contingent on the denotations of the root and its complement. Agentivity is simply the sub-class of [intentional, rational] direct participants and is never individuated or encoded as such. A second question which arises is why derived nominals should impose this restriction, absent in verbs. How is the requirement for a direct cause or agent represented? A possible reply, of course, is that verbs are associated with an extended vP / VoiceP; only an extended vP / VoiceP introduces external arguments which are not agents or direct causes; agents and direct causes are represented within root meaning; derived nominals lack the equivalent of an extended vP / VoiceP. One of the problems alluded to above, and discussed in more detail below, is that having agentivity or direct causation associated with roots of alternating verbs leads to over-generation when the argument is not expressed. In the verbal domain it neutralizes the distinction between inchoative anti-causatives and passive, as well as similar distinctions in the nominal domain, as discussed shortly below. It appears therefore that the restriction should be encoded at a level which is above the category-neutral root. For example, as a selection restriction associated with nominalizing affixes. After showing, in the remainder of this section, that the constraint has some generality beyond English, it is proposed in section 3

that the requirement imposed by derived nominals is for a particular event size, a single, simple, event. This explains the restriction to direct participants, since only direct participants can combine with a root and its complement within a simple event. If correct, nominalizing affixes of the idiosyncratic variety will be constrained to combine with single simple events.

As mentioned above, the claim that agentivity or direct causation are associated with the root of all potentially transitive roots neutralizes the division between non-alternating and alternating verbs which, on their inchoative uses, carry no implication of a CAUSE at all. The absence of a CAUSE in inchoatives is in sharp contrast with the salient agentive interpretation implicated in Hebrew nominalized causatives when the agent is omitted, presented immediately below. To the extent that the proposal in terms of event-structure is on the right track, the implication of agentivity is triggered by a general constraint on the structure of events. Since it need not be encoded within the root, the division between alternating and non-alternating verbs is preserved, and so are differences between inchoatives and causatives with implicit agents and their nominal counterparts.

Independent evidence for the claim in Harley and Noyer (2000) that the restriction to agentivity / direct causation cuts across the causative typology is presented by Hebrew. Hebrew has two alternating causative constructions which pattern differently from English, causatives based on unergatives and object-experiencer psych verbs (henceforth, Obj-Exp). Nevertheless, they show a similar restriction to agentivity, suggesting that the phenomenon has some generality and is not just an English quirk.[2] Derived nominals based on Obj-Exp verbs also illustrate, in the nominal domain, a problem for generalized root-based accounts of agent exclusivity. Similar to the difference between inchoatives and passives, one class of derived nominals completely lacks an external cause, and in the other class it is present and exclusively agentive. To the extent that the proposal in terms of event-structure is on the right track, the implication of agentivity is triggered by a general constraint on the structure of events.

Unlike English, causatives built from unergatives are not necessarily agentive. The corresponding derived nominals, however, are. Unergative 'run' and 'jump', for example, produce morphological causatives with either agentive or CAUSE subjects, in (16). When nominalized, the agent can optionally be expressed as a by-phrase, in (17a/c), and a CAUSE cannot be ex-

[2] See Alexiadou and Schäfer (2006) and Alexiadou, Anagnostopoulou and Schäfer (2009) for cross-linguistic variation in this domain, and for a class of German nominalizations which share the restriction.

pressed at all, in (17b/d), unless it is understood to denote the cause of the agent's behavior (see further below).

(16) a. *ha-me'amen heric et ha-pluga be-meSex xaci Sa'a*
the-trainer ran.CAUS ACC the-battalion for half hour
'The trainer ran the battalion for half an hour'

b. *ha-kin'a merica oto*
the-jealosy run.CAUS him
'Jealousy makes him run (=motivates him)'

c. *ha-joki hikpic et ha-sus*
the-jocky jumped.CAUS ACC the-horse
'The jocky jumped the horse'

d. *ha-de'aga hikpica oto me-ha-mita*
the-worry jumped.CAUS him from-the-bed
'His worries caused him to jump out of bed'

(17) a. *ha-haraca Sel ha-pluga (al yedey ha-me'amen)*
the-running.CAUS of the-battalion (by the trainer)
'The running of the battalion by the trainer'

b. **ha-haraca Selo al yedey / biglal ha-kin'a*
the-running.CAUS of.him by because the-jealosy

c. *hakpacato me-ha-mita (al yedey ha-magad)*
jumping.CAUS.his from-the-bed (by the commander)
'His being made to jump from bed by the commander'

d. **hakpacato me-ha-mita al yedey / biglal ha-de'aga*
jumping.CAUS.his from-the-bed by because the worry

The agent may also be completely omitted, as in the versions of (17a/c) without a by-phrase. Nevertheless, the interpretation is necessarily agentive in the intended sense: the event of running or jumping was directly instigated by something or someone. The implication of an instigator, whether explicitly realized or not, explains why (17b/d) are odd. In fact, they are fine if the 'because phrase' can be understood to designate the cause of the instigator: x got y to run because of x's jealousy; x got y to jump because of x's worries. Because-phrases are no different in this respect from other modifiers, which can, in fact, must, modify the instigator:

(18) a. *ha-haraca ha-txufa Selahem*
the-running.CAUS the-frequent of.them
'The frequent causing them to run'

b. *ha-haraca Sel ha-pluga kedey le-hatiS otam*
the-running.CAUS of the-battalion in order to-exhaust them
'The causing of them to run in order to exhaust them'

Hebrew derived nominals based on causatives of unergative verbs pattern exactly like English nominals derived from alternating verbs. The verbal form in both allows both agents and causes, whereas the nominalization is restricted to an agentive interpretation.

Another example of agent exclusive transitive nominalization where the corresponding verb is not necessarily agentive comes from derived nominals based on Obj-Exp verbs, which I will call psych-nominalizations. The landscape of psych-nominalizations is more complex than in English due to special morphology associated with both causatives and anti-causatives in the Obj-Exp verbal domain. Corresponding to the causative typology, there are two classes of Obj-Exp verbs in Hebrew, and both produce derived nominals. Class I has simple morphology on the causative and complex morphology on the anti-causative, and nominalization of the causative form produces a stative, or result noun, on a par with English ('The children's amusement' vs. *'Mary's / the film's amusement of the children). Class II, however, has complex morphology on the causative, in (19a–b) and (20a–b), and here event-related nominalization is possible. The verbal form, like Obj-Exp verbs generally, is not necessarily agentive.

(19) a. *ha-seret hifxid et rina* causative
the-film frightened ACC rina
b. *dani hifxid et rina* possibly agentive
dani frightened ACC rina
c. *rina paxda (ba-seret / me-dani)* stative
rina was.afraid in.the-film / from dani

(20) a. *ha-xadaSot hix'isu et rina* causative
the-film angered ACC rina
b. *ha-yeladim hix'isu et rina* possibly agentive
the-children angered ACC rina
c. *rina ka'asa biglal ha-xadaSot / al ha-yeladim* stative
rina was.angry because the-film / on the-children

Verbal templatic morphology is preserved in nominalization, a morphological signature which keeps transparent the derivational history of the nominal. The following examples show derived nominals based on the causative

Obj-Exp form. As in English, it is impossible to create an ordinary transitive nominalization, for both agents and causes, in (21a) and (22a). The post-nominal genitive in the (b) examples can only denote the Experiencer, but the DP as a whole is interpreted as transitive, with the external argument suppressed. In this respect it clearly differs from the nominalization of the stative anti-causative which denotes a result noun (as seen by the possible pluralization in (21c) and (22c)) and is clearly intransitive. The transitive interpretation of Obj-Exp nominalizations is exclusively agentive. It is possible to add a by-phrase denoting an agent, in (21d) and (22d), but not a CAUSE.[3] This is of course in sharp contrast to the verbal forms, which have CAUSE subjects which may, but need not, be agentive.

(21) a.**ha-hafxada Sel ha-seret / dani et rina*
the-frightening of the-film / dani ACC rina

b. *ha-hafxada Sel rina* — only agentive
the-frightening of rina
'the frightening of Rina'

c. *ha-pxadim Sel rina*
the-fears of rina
'Rina's fears'

d. *ha-hafxada Sel rina al yedey dani* — only agentive
the-frightening of rina by dani
'the frightening of Rina by Dani'

e.**ha-hafxada Sel rina al yedey / biglal ha-seret*
the-frightening of rina by because the-film

(22) a.**ha-hax'asa Sel ha-xadaSot / ha-yeladim et rina*
the-angering of the-news / the-kids ACC rina

b. *ha-hax'asa Sel rina* — only agentive
the-angering of rina
'Rina's angering'

c. *ha-ke'asim Sel dina*
the-angers of dina
'Dina's bouts of anger'

[3] With the same caveat as in (17b/d); the because-phrase is possible if it can be understood to specify the cause of the instigator, i.e. someone or something frightened / angered Rina because of the film.

d. *ha-hax'asa Sel rina al yedey ha-yeladim* only agentive
the-angering of rina by the-kids
'the angering of Rina by the kids'

e. **ha-hax'asa Sel rina al yedey / biglal ha-xadaSot*
the-angering of rina by because the-news

Hebrew causativization of unergatives and nominalization of Obj-Exp psych verbs both differ from their English counterparts. Nevertheless, the effect of nominalization is identical: where the corresponding verbal form may include CAUSE subjects, the derived nominal is restricted to agentivity. As such, they strengthen the conclusion based on Harley and Noyer (2000) that agent exclusivity characterizes all transitive derived nominals (at least in English and Hebrew) and cuts across the causative typology. At the same time, they also show that a solution at the level of the root, in which all potentially transitive roots encode agentivity or direct causation, is probably too strong. It couldn't easily account for systematic differences between the two classes of Obj-Exp nominalizations in Hebrew, or between inchoatives, which clearly lack an external argument, and derived nominals with an implicit external argument.

The division between anti-causative inchoatives and derived nominals with an implicit argument appears to be preserved in the nominal domain in English as well. When the external argument is not expressed, derived nominals based on obligatory transitives continue to imply agentivity, whereas derived nominals based on alternating verbs do not necessarily imply agentivity. The examples in (23) are all interpreted as transitive and agentive, whereas (24) seem to be ambiguous between transitive and intransitive readings:

(23) a. the destruction of the city
b. the creation of controversy
c. the burial of John

(24) a. the separation of Jim and Tammy Faye
b. the explosion of the balloon
c. the solidification of our agreement

In what follows I argue that the generalization regarding restrictions on transitive derived nominals, rather than being captured at the level of the root, revolves around temporality, the structure of events, and a restriction to single, simple, events.

3. Agent as co-temporal cause

The preference for an agent is clearly not a general property of pre-nominal genitives. Pre-nominal genitives need not host an external argument, let alone an agent:

(25) a. Mary's team (owns the team, is a fan / member of the team, etc.)
b. the camp's demolition (theme interpretation)
c. yesterday's demolition (adjunct interpretation)

The restriction applies only to derived nominals, transitive and intransitive, whose corresponding verbal forms have an external argument as subject.[4] But even within this domain, it is not absolute. It is only apparent in the choice between agents and CAUSES: Goals, Sources, and various kinds of Experiencers are fine, with a variety of affixes, in (26).

(26) a. John's receipt of the package
b. The navy's transmission of the message
c. Mary's realization of the source of her problems
d. Dina's adherence to our manifesto

The compatibility of Goals, Sources, and Experiencers suggests that the constraint in derived nominals is probably not akin to the varieties of passive which appear to restrict the suppression of the external argument to Agent (Zaenen 1993; Doron 2003; Doron and Alexiadou 2007; see also Alexiadou, Anagnostopoulou and Schäfer 2009 for arguments against an analysis in terms of verbal passive). Neither does the constraint appear to involve a restriction to humans. The pre-nominal genitive in nominalizations of non-alternating causatives need not be human, partially repeated from (6) (from Pesetsky 1995).

(27) a. The bomb's destruction of the camp
b. The sun's illumination of the room
c. The volcano's fortuitous burial of Herculaneum
d. the proposal's creation of controversy

[4] In English, however, the restriction effectively applies almost exclusively to transitive derived nominals. For reasons which may or may not be related, the majority of derived nominals based on unergatives have either only ING-OF counterparts, or zero-derived counterparts, which in general do not produce eventive nominalizations (Alexiadou 2001; Harley 1999).

The examples in (27) all include genitives which are not 'agentive' if that notion is defined only in terms of the properties of the participant. I will refer to inanimate entities of this sort as 'natural forces'. Harley and Noyer (2000) have shown that transitive derived nominals based on alternating verbs depend on the combination of the denotations of the participants and the root. Here I show that the distribution of forces in the pre-nominal genitive position is similar across nominals based on alternating and non-alternating verbs. It is sensitive in a similar way to the combination of the denotations of the participants and the root in a way which suggests that the relevant notion involves direct participation. Whereas 'the sun' is compatible with 'illumination', it isn't compatible with 'postponement', at least not on our normal understanding of the properties of the sun; 'the volcano' is compatible with 'burial' but not generally, and 'the wind' is compatible with 'dispersal' but not with 'cancellation':[5]

(28) a. #The sun's postponement of the hike
b. #The volcano's creation of panic

(29) a. The soldiers counted on the wind's quick dispersal of the tear gas
b. #They counted on the wind's cancellation of the outdoor show

In these particular cases derived nominals are not necessarily different from the corresponding clauses:

(30) a. The sun illuminated the room / #The sun postponed the hike
b. The wind dispersed the tear gas / #The wind cancelled the outdoor show

I will assume that the subject in English lexical causatives has to be a direct cause of the event denoted by the verb. Verbs such as 'postpone' and 'cancel' name a result which is not directly caused by the natural force; typically, it is human agents who cancel or postpone events. In contrast, 'illuminate' is directly brought about by the sun and 'disperse' is directly brought about by the wind, by virtue of the inherent properties associated with these forces. Derived nominals are no different in this respect from the corresponding verbal forms and indirect causes are similarly excluded.

Continuing to restrict attention to non-human natural forces and CAUSES in non-alternating causatives, the following examples show that the restric-

[5] Given that what seems to be stake in all these cases is semantic incompatibility, the pound sign is used from now on to note semantic anomaly or incompatibility.

tion in derived nominals is in fact tighter, and that the options for the prenominal genitive form a subset of the options available to clausal subjects. 'The hurricane' is a possible clausal subject of 'destroy' and 'devastate' and it is also compatible with derived nominals such as 'devastation' and 'destruction', in (31). It is possible as the clausal subject of 'justify', but not with 'justification', where a human agent is possible, perhaps necessary, in (32e–f):

(31) a. The hurricane destroyed all the crops
b. The hurricane's destruction of our crops
c. The destruction of our crops by the hurricane
d. The hurricane devastated ten coastal communities in Nicaragua
e. The hurricane's devastation of ten coastal communities in Nicaragua
f. The devastation of ten coastal communities by the hurricane

(32) a. The approaching hurricane justified the abrupt evacuation of the inhabitants
b. #The approaching hurricane's justification of the abrupt evacuation of the inhabitants
c. #The justification of the abrupt evacuation of the inhabitants by the hurricane
d. The authorities justified the rapid evacuation of the inhabitants
e. The authorities' justification of the rapid evacuation of the inhabitants
f. The justification of the rapid evacuation of the inhabitants by the authorities

A verb such as 'justify' can have a CAUSE as its subject or an agent who performs the act of justifiying. A natural force such as 'hurricane' can only be interpreted as a causing event, whereas with 'illuminate' or 'disperse' it can be interpreted as the force which brings about these results directly. The fact that 'illumination' and 'dispersal' are compatible with 'the hurricane', whereas 'justification' is not, suggests that direct causation is not sufficient without direct participation in the denoted event. A similar pattern is observed with 'verification'. The subject of the verb can be human and agentive or a causing event such as 'the results', and the derived nominal requires an agent:[6]

[6] It is certainly debatable whether 'justify' and 'verify' on their non-agentive uses are true causatives or statives which denote relations between events or propositions (Edit Doron, Malka Rappaport-Hovav p.c.). Here I assume that they are

(33) a. The results verified the initial diagnosis
b. #The result's verification of the initial diagnosis
c. #The verification of the initial diagnosis by the results
d. The expert's verification of the initial diagnosis
e. The verification of the initial diagnosis by the expert

Inanimates are thus compatible with derived nominals only when they can be construed as forces which directly bring about the event, and impossible when construed as causing events, even if causation is direct, as it certainly may be in (32b/c) and (33b/c). This suggests that the requirement imposed by derived nominals is tighter than the requirement imposed by verbs, and that it involves direct participation above and beyond direct causation. In all of the good cases, in (27), (29a), (31b/c), (32e/f), (33d/e), the entity denoted by the genitive is a direct participant in the denoted event. Direct participation may be guaranteed by the relationship between the event denoted by the nominal and some property which is inherent to the entity denoted by the genitive: the property of the sun which causes it to emit light, the property of wind which causes it to scatter light objects, the brute force associated with hurricanes which often leads to destruction of human artifacts. With humans, on the other hand, their inherent properties, including intentionality, volition and mobility will often be sufficient to allow for direct participation regardless of the choice of nominal. Therefore, the particular denotation of the root and other participants appears not to play the same role. Since mobility, volition, or intentionality cannot be attributed to inanimates, the typical route to direct participation in an event is by virtue of an inherent property directly related to the denoted event.

The requirement for direct participation is also observed in derived nominals based on alternating verbs. These too allow inanimates just in case they can be construed as direct participants. 'The war' and 'the separation of Jim and Tammy Faye' differ in their granularity and so the former cannot be construed as a direct participant in the latter, though it can be construed as the direct instigator of 'the destabilization of the economy', in (34c).

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causatives, since a stative analysis, to the extent that statives are simple, would lead to the expectation that they should easily nominalize, on a par with 'destruction'. Note that a stative analysis has an advantage in explaining the possibility for anti-causative interpretation when the external argument is not expressed, as in (i), placing them on the side of alternating verbs (see (23) and (24) above).

(i) a. the verification of the diagnosis
b. the justification of/for our actions

(34) a. The economy de-stabilized
b. The war destabilized the economy
c. The war's destabilization of the economy brought more people to the poles
d. The war separated Jim and Tammy Faye
e. #the war's separation of Jim and Tammy Faye

(35) a. Her skills developed
b. The exercise developed her analytic skills
c. The exercise's development of her analytic skills surprised Mary
d. The exercise expanded her interest in syntax
e. #The exercise's expansion of her interest in syntax surprised Mary

The following paradigm shows a three-way contrast. 'The weather' is compatible with 'improvement' but not with 'alteration', where it is not a direct participant, since with a theme such as 'plans', it is typically human agents rather than natural forces who bring about changes in plans. That is not to say, however, that 'alteration' is never compatible with a natural force. When the theme denotes an entity which undergoes a change which is necessarily externally caused, the natural force becomes possible as a direct participant:[7]

(36) a. Mary's mood improved
b. The weather gradually improved her mood
c. John was amazed by the weather's gradual improvement of Mary's mood
d. The weather altered their plans
e. #The weather's alteration of their plans disappointed Jim and Tammy Faye
f. The wind altered the position of the rocks
g. the wind's alteration of the position of the rocks

Examples (31)–(36) point to a difference between causative verbs and their derived nominal counterparts. Whereas direct causes may be sufficient with verbs, direct participation is required in derived nominals.[8] The relations are

[7] Thanks to Malka Rappaport-Hovav for bringing (36f–g) to my attention.

[8] An anonymous reviewer points out that the subjects in the verbal constructions in (32)–(36) are thematically distinct, and raises an important question about the generalization behind verbal subjects in English. Basic contrasts such as those in (30) suggest that the notion of direct causation may be relevant, but (32a) and

close but they are not identical. Direct causes, according to Wolff (2003), are the most proximate CAUSES in a causal chain leading up to the event denoted by the predicate. Crucially, however, a direct cause may be temporally or spatially removed from the main event. Direct participants, on the other hand, must be co-temporal and in some sense co-spatial with the unfolding event.[9] Whereas co-temporality may hold of the relation between 'the exercise' and 'development', it does not hold of 'the exercise' and 'expansion', since the expansion of Mary's interest in syntax will typically take effect after the completion of the exercise. Similarly, whereas 'the improvement of her mood' may easily be construed as co-temporal with 'the weather', 'the alteration' is punctual.

I propose, therefore, to derive the restriction on the external argument from the distinction between co-temporal and non-co-temporal complex events (Levin and Rappaport-Hovav 1999, 2002; Parsons 1990). Non-co-temporal complex events have the event-structure of an accomplishment. A co-temporal complex event, in which the sub-eventualities overlap, is represented as a single, simple event. The representation as a single event is produced by event identification, subject to the following conditions (Levin and Rappaport-Hovav 1999, 2002; Rappaport-Hovav and Levin 2001):

(37) Conditions on event identification

I. The sub-events must have the same location and are necessarily temporally dependent. To be identical, two events must have the same spatial and temporal properties.

II. One sub-event must have a property that serves to measure out that sub-event in time; this property is predicated of an entity that is necessarily a participant in both sub-events. This ensures temporal dependence, i.e. that the two sub-events unfold at the same rate.

Bare XP resultatives, for example, denote single events in this sense. The activity described by the verb is co-temporal with progress towards the achievement of the result, in (38). English lexical causatives, on the other

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(33a) suggest that this might not be sufficient, since 'the hurricane' or 'the results' do not seem to denote causes in the relevant sense. I leave this question open to future research.

9 The caveat with respect to spatial identity is intended so as to apply to somewhat abstract relations between forces and events and our conceptualization of these relationships, as in (34) where 'the war' may we waged overseas and 'de-stabilization' may apply to the homefront economy.

hand, denote complex events, since the two sub-eventualities can be temporally distinct, in (39).

(38) a. Carey ran / waltzed out of the room
b. The clothes steamed dry
c. The kettle boiled dry
d. Carey rustled out of the room

(39) a. Casey's piano playing woke the baby
b. Terry shocked Sandy by deciding to run for office
c. The widow murdered the old man by putting poison in his soup

We have seen above that derived nominals differ from verbal lexical causatives in a way which is related to the difference between (38) and (39). Like bare XP resultatives, derived nominals denote simple events. Unlike bare XP resultatives, however, event identification does not apply to separately lexicalized activities and results, and the shared participant is not an internal argument. To extend event identification to transitive derived nominals, it must be allowed to apply to the relationship between the CAUSE and the event denoted by the derived nominal: the participation of the CAUSE is co-temporal with the unfolding of the event denoted by the derived nominal. Having event identification apply to the relation between the causer and the caused event implies that the shared participant is the external argument. To recall, the generalization should distinguish, for example, between (40a) and (40b):

(40) a. The teacher's separation of Jim and Tammy Fay
b. #The war's separation of Jim and Tammy Fay
c. The war's de-stabilization of the economy

'The teacher' in (40a) can be construed as a participant in the causing sub-event and in the event of separation, ensuring event co-temporality between the two sub-events and leading to event identification. 'The war', however, is construed as a non-co-temporal CAUSE in (40b), whereas in (40c) it may be construed as a force, i.e. an instigating participant.[10] This relation is to be kept distinct from agentivity, which requires, in addition, volition and intentionality, and is just one particular instantiation of direct participation.

[10] It seems though that full temporal overlap is not necessary, and that the unfolding of the war and of de-stabilization need not be co-extensive; all that is required is that the force be active at the point at which the event begins to unfold.

We have seen that the participant need not be human, and that more generally, the properties which qualify a potential external argument are related to the denotation of the entire event, above and beyond the properties associated with the external argument. The relation between the *external argument* and the *unfolding event* in derived nominals is subject to the condition in (41a) and its corollary in (41b).

(41) a. If a simple event includes an external argument, the participation of the argument is co-temporal with the initiation of the event
b. Corollary: When the participation of the external argument is not co-temporal the event is a complex event

The requirement for co-temporality of the external argument directly suggests that derived nominals are restricted to simple, single, events. Indirect causes are impossible as external arguments, but so are direct causes excluded if their participation is not co-temporal with the initiation of the event (examples (28)–(36)). Since human agents can easily be construed as direct participants, they are typically possible; indirect causes are always impossible. Inanimate forces are possible only as direct participants.

A prediction made by this analysis is that manner verbs whose external argument is non-animate and non-agentive should produce good derived nominals, since manner verbs denote simple events and the external argument is a direct participant. Verbs falling under this description are emission verbs, i.e. 'flicker', 'bubble', 'ring', 'stink', 'ooze'; and contact verbs such as 'rub' and 'scrub'. It is difficult to test this in English unfortunately, because the majority of 'manner/activity' denoting verbs of this type either only have ING-OF or zero-derived counterparts, and the latter do not produce event nominals (Harley 1999; Alexiadou 2001). Hebrew nominalization is fully productive within this class. Verbs of emission produce good event derived nominals:

(42) a. *ha-cilcul ha-xozer Sel ha-Sa'on he'ir ba-sof et rina*
the-ring the-repeated of the-clock awoke finally ACC rina
'The clock's repeated ringing finally woke Rina up'
b. *ha-bi'abu'a Sel ha-marak be-meSex Sa'atayim hafax oto le-daysa*
the-bubble of the-soup for two hours turned it to-porridge
'The soup's bubbling for two hours turned it into porridge'
c. *ha-hivhuv Sel ha-televizia kol ha-layla lo hifri'a le-rina*
the-flickering of the-tv all night NEG bother to-rina
'The TV's flickering all night long didn't bother Rina'

Similarly, verbs of contact allow inanimates and an additional complement:

(43) a. *ha-SifSuf Sel ha-kise ba-ricpa*
the-rub of the chair in.the-floor
'the rubbing of the chair against the floor'
b. *ha-xikux Sel ha-galgal ba-midraxa*
the-friction of the-wheel in.the-sidewalk
'the friction of the wheel against the sidewalk'

Summarizing, the restriction of derived nominals to simple events has the effect of requiring that the external argument be a direct participant. With human participants, their inherent properties will usually be sufficient to guarantee a co-temporal construal, regardless of choice of nominal, whereas with inanimates, direct participation and event co-temporality will depend on the denotations of the event and other participants combined with our knowledge and conceptualizations of possible simple events. Agent exclusivity, from this perspective, is simply a misnomer.

We have seen that root-based approaches run into difficulties when it comes to expressing the difference between intransitives which have an implicit agent and those that do not (inchoatives vs. passives in the verbal domain; nominals derived from alternating and non-alternating verbs; class I and class II psych-nominalizations in Hebrew). The generalization in terms of event simplicity provides independent motivation for expressing these restrictions above the level of the root, within a domain which is specific to nominals. A natural implementation is in terms of the selectional restrictions imposed by nominalizing affixes (-ation, -ence, -ity, etc. but not -ing) such that these affixes can combine only with simple events. In principle, this could be either a syntactic constraint or a semantic constraint and a more comprehensive discussion and conclusive choice between the two will have to await further study. To the extent that complex events and simple events have the same denotation, it is unlikely that the restriction is related to semantic composition. To the extent that event identification creates simple events which are telic but are not achievements ('destroy', 'separate', 'amuse', and 'disperse' on their agentive construals), event identification would imply an extension of the basic aktionsart typology if produced at a non-syntactic level of representation. The analysis of nominal passive and the by-phrase, and in particular their sensitivity to event-structure boundaries, further favor a syntactic treatment of these constraints.

4. Nominal passive

The constraint on derived nominals sanctions any sort of event as long as it is simple. Section 2 focused on the instigation of the event and restrictions on the external argument in transitive derived nominals. Another option, consistent with the generalization, is that only the lower portion of a complex event is included, an option which appears to be realized in nominal passive in English.

A number of well known differences between nominal and verbal passive in English suggest that nominal passive is confined to a reduced structure. The idea is not new, and has been developed in at least three different ways. Grimshaw (1990) has argued, from a lexical perspective on derived nominals, that nominal passives do not denote events, which, in the system developed in Grimshaw (1990), implies that they lack argument-structure. Doron and Rappaport (1991) argue for a similarity between nominal passive and middles in English and propose an analysis in terms of event-structure, to be discussed in more detail below. From a syntactic perspective according to which derived nominals contain a vP (Hazout 1991; Borer 1993; Fu, Roeper and Borer 2001), Den Dikken and Sybesma (1998) and Alexiadou (2001) have argued that nominal passive is restricted to the lower VP. Continuing to remain neutral regarding the syntactic correlates of event structure in nominals, the purpose of this section is to show that the restrictions on English nominal passive can be understood to fall under the broader generalization that derived nominals are confined to simple events.

Unlike verbal passive, nominal passive is subject to an affectedness constraint. Only affected objects can surface in the pre-nominal genitive position (Anderson 1984), in (44).

(44) a. the tomatoes' growth
b. the bow's vibration
c. his salary's diminishment
d. *the cliff's avoidance
e. *that car's pursuit
f. *the mistake's realization

Nominal passives also fail standard diagnostics for an implicit external argument, implying that in nominal passive the external argument is completely absent (Roeper 1987; Safir 1989; Grimshaw 1990). Depictive modification of the implicit agent is possible in the active version (45a), but not in the passive (45b), and the implicit agent fails to control the subject of a purpose clause in the passive, in (46):

(45) a. The dispersal of the crowd nude gave the officer a bad reputation
b. *The crowd's dispersal nude gave the officer a bad reputation

(46) a. the translation of the book [in order PRO to make it available to a wider audience]
b. *the book's translation [in order PRO to make it available to a wider audience]

Doron and Rappaport (1991) link the affectedness constraint to the absence of the external argument associated with the counterpart verb, and argue that nominal passive involves lexical externalization of the internal argument. Affectedness, on this analysis, is defined structurally, in terms of events: an affected object is contained within a sub-event distinct from the sub-event containing the external argument. In other words, the subset of derived nominals which allow passive are those in which the object is contained within a distinct and lower sub-event. In more recent work, and fully consistent with the proposal that affected objects are individuated by the structure of events, direct objects in complex accomplishment structures have been independently claimed to be subjects of the lower, embedded sub-event (Tenny 1994; Rapoport 1999; Levin 1999). This suggests that the process of lexical externalization may not be a necessary ingredient, since affected objects are, to begin with, subjects of the lower event.[11] The observation that the external argument is radically absent, combined with the assumption that the external argument in complex events is introduced by a separate predicative head, suggests that the entire causing sub-event is absent in nominal passive and that passive derived nominals are confined to the lower sub-event.

The event-structure analysis of affectedness and nominal passive in Doron and Rappaport (1991) meshes well with the generalization proposed in section 3 and provides independent support for the link between event-structure and the shape of derived nominals. Accomplishments and lexical

[11] Doron and Rapppaport (1991) claim, contra Grimshaw (1990), that the fronted NP in nominal passive must be an argument of N^{o} (See also Borer 1993 and Alexiadou 2001 for the claim that passive nominals are eventive). The head noun cannot pluralize without semantic drift, in (ia) vs. (ib), a hallmark of event-denoting derived nominals. (ib) can only mean 'housing complexes', with 'city' as possessor.

(i) a. the city's development
b. the city's developments

causatives have complex event-structure which cannot fit into the event size allotted to derived nominals. One way to fit them in is via co-temporality of the CAUSE and event identification. This is the route to English transitive derived nominals and nominal passive in Hebrew.[12] Another route, leading to nominal passive in English, is via suppression of the causing sub-event.[13]

The confinement to a simple event may also explain another peculiarity in English nominal passive, observed in restrictions imposed by the by-phrase compared with the by-phrase in verbal passive. Section 2 mentioned Hebrew nominal passive, which has the implicit external argument restricted to agentivity (in (17), (18), (21), (22) above), whereas English has the entire causing sub-event suppressed. Beyond this difference, however, a related agent-exclusivity effect may be behind the restriction on English by-phrases. Fox and Grodzinsky (1998) show that unlike its verbal counterpart, the nominal by-phrase is limited to effectors. It allows agents, instruments, and creators, and excludes goals and experiencers:

(47) a.	the imprisonment of refugees by the government	agent
b.	the destruction of the city by lightening	instrument
c.	CK1 by Calvin Klein	creator/possessor
d.	the receipt of the package (*by John)	goal
e.	the realization of the mistake (*by John)	experiencer

[12] The Hebrew examples above with the external argument implicit ((17)–(18) and (21)–(22)) are all instances of nominal passive, in which the internal argument surfaces with the genitive Case reserved for external arguments when present (Hazout 1991; Borer 1993). Regarding the status of the external argument, Hebrew nominal passive is equivalent to English active nominals with the external argument implicit and restricted to agentivity and co-temporality.

[13] Languages thus differ in the formation of nominal passive. Hebrew nominal passive more closely resembles verbal passive, whereas in English, it more closely resembles middles and anti-causatives. Both configurations satisfy the single-event requirement, though in different ways. How exactly to account for the source of variation is an important question which can only be touched upon briefly. On one possible approach, the difference may reduce to syntactic resources, such that Hebrew nominals allow A-movement in DP (see Sichel (2007) for Raising in Hebrew DP). Since English DP does not allow A-movement, it satisfies the single-event constraint by severing the causing sub-event. On another approach, languages with complex anti-causative or middle morphology such as Hebrew cannot sever the causing sub-event without a change in morphology, and must resort to the verbal A-movement strategy. The interaction of syntactic and morpho-semantic resources in passive nominalization awaits further study in a broader cross-linguistic context.

Fox and Grodzinsky (1998) argue that the 'by' of nominal passive is lexically restricted to select effectors, a thematic class which includes agents, instruments or forces, and creators, whereas verbal 'by' is lexically underspecified, allowing any kind of external argument suppressed by passive.[14] The postulation of lexical ambiguity for a functional morpheme such as 'by', though, is less than optimal, and the correlation with syntactic category seems to point to systematic differences across categories and potentially to the event complexity constraint. Given that the by-phrase allows inanimate forces (47b), the relation to event complexity can be tested by closer examination of the distribution of inanimates in the by-phrase. If the by-phrase is like the inanimate pre-nominal genitive in active derived nominals, whose participation must be co-temporal with the instigation of the event, the by-phrase is expected to favor co-temporal over non co-temporal inanimate forces. The following show that non co-temporal CAUSES or forces do appear to be degraded:

(48) a. The devastation of ten coastal communities by the hurricane
b. The destruction of our crops by the tornado
c. the verification of the initial diagnosis (by the expert / #by the results)
d. the justification of the evacuation (by the authorities / #by the hurricane / tornado)
e. the separation of Jim and Tammy Faye (by the teacher / #by the war)
f. the destabilization of the economy by the ongoing war

The similarity of by-phrases to pre-nominal genitives suggests that here too, what appear to be thematic restrictions are better understood in terms of event-structure and the restriction to a simple event. The difference in the compatibility of hurricanes and tornadoes across (48a-b) and (48d), and wars across (48e) and (48f) shows that a formulation in terms of 'effector', or any role defined only in terms of the properties of the participant, cannot quite be correct. Conversely, the fact that the by-phrase patterns with the pre-nominal genitive in this respect suggests that by-phrases cannot augment a simple event into a complex event and cannot exceed the limits on event complexity.

There remains, nevertheless, a residual difference between pre-nominal genitives and nominal by-phrases: the former allow goals and experiencers

[14] See also Alexiadou, Anagnostopoulou and Schäfer (2009) for cross-linguistic similarities and differences in the restriction to agents in various sorts of derived nominals.

and the latter do not. Given that by-phrases share with pre-nominal genitives the restriction to simple event-structure, the difference seems to point to the status of goals and experiencers vs. agents and forces. A better understanding of the composition of genitives and by-phrases with thematic material may help resolve a longstanding question regarding the status of external arguments in derived nominals (as adjuncts, see Rappaport 1983; Dowty 1989; Grimshaw 1990; Kratzer 1996; Fox and Grodzinsky 1998; Alexiadou 2001; as arguments, see Roeper 1987, 1993, 2004; Longobardi 2001; Sichel 2009).[15] If the following is on the right track, it appears that goals and experiencers are not arguments in derived nominals, while agents and forces are.

The examples in (48), and in particular the observation that the compatibility of inanimate forces varies with choice of nominal, show that 'by' cannot be lexically specified to select a particular role. Restrictions imposed by nominal 'by' must therefore reduce to general nominal properties in conjunction with the general nature of 'by'. The fact that 'by' is excluded in middles and in adjectival passive may suggest that 'by' can only express implicit arguments, since, on standard assumptions, middles and adjectival passives do not have implicit external arguments. Since only arguments can be implicitly present, the incompatibility of 'by' with experiencers and goals would imply that in nominals, experiencers and goals are not arguments, but that agents and certain kinds of forces are. If goals and experiencers are not arguments, yet can appear in the pre-nominal position, the pre-nominal genitive must be an adjunct, along the lines suggested by Rappaport (1983), Dowty (1989), Grimshaw (1990), Kratzer (1996), Fox and Grodzinsky (1998) Alexiadou (2001).[16]

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[15] Here I will assume, possibly too simplistically, that goal and experiencer subjects are external arguments. For Experiencers in clauses as internal arguments, see Doron (2003) and Landau (2009). It is not immediately clear how an analysis of Experiencers as internal would account for their non-argument status in nominals. See also Pyllkänen (2008) and Cuervo (2003) for goals and experiencers as introduced by an applicative head, in between internal and external arguments.

[16] The claim leads to the expectation that when not expressed as pre-nominal genitives they are not available as implicit arguments. Unfortunately, this is difficult to test, since the diagnostics impose restrictions which often exclude experiencers and goals. Purpose clauses, for example, require an agentive implicit argument and are not useful for implicit experiencers and goals. Depictive modification is good with direct objects in accomplishments but not in activities, in (i) (Rapoport 1999). It also appears to be degraded with experiencer and goal sub-

This, however, cannot be entirely correct because the initial premise, that the by-phrase can only realize suppressed arguments, is possibly true for verbs and adjectives, but probably not for nominals. In nominals, the by-phrase can occur with transitive derived nominals, such as 'the bombardment of the strip', where the external argument is implicit, but also with passive nominals, where it is completely absent (recall the discussion of (45)–(46)). When it occurs with a passive nominal, 'by' must therefore be adding an argument, rather than expressing an argument which is present yet implicit. The possibility of adding an argument appears to be unique to nominal 'by'. If, however, adding material is in principle possible, it is no longer clear why goals and experiencers are excluded; even if they are adjuncts, it should be possible to introduce them with 'by'. On the assumption that 'by' can introduce new material, the characterization of experiencers and goals as adjuncts is not sufficient for explaining the limitations on nominal 'by'. Why can 'by' introduce agents and forces but not goals and experiencers?

It appears that nominal 'by' is sensitive to event-boundaries in the same way that nominal passive is. As discussed above, nominal passive cannot apply when the external argument is an experiencer or goal (the affectedness paradigm in (44)), the same roles which cannot be introduced by nominal 'by'. It is unlikely that this similarity is accidental. To recall, nominal passive is impossible when the external argument is an experiencer or goal because the configuration is confined to the lower sub-event, and that sub-event excludes agents and forces but not experiencers and goals.[17] Extending this

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jects, in (ii), so the incompatibility with un-expressed experiencers and goals in (iii) doesn't tell us much about their argument status in nominals. Other diagnostics, such as the compatibility of 'by oneself' also seem to require action and agentivity.

(i) a. Jones fried the potatoes raw
b. Jones phoned Smith sad (can only modify the subject)

(ii) a. *Jones loved / feared Smith sad
b. *Jones received the news sad

(iii) a. *the love / fear of Smith sad
b. *the receipt of the package sad

[17] Doron and Rappaport (1991) call this 'the separability property' and attribute it to morphological relatedness between active and passive in nominals:

(i) The Principle of Morphological Relatedness:
For two predicators with distinct e-structure to be morphologically related, they must contain a sub-eventuality in common

analysis to restrictions on nominal 'by' implies that nominal 'by' can only add material associated with a sub-event distinct from the sub-event expressed by the passive nominal. Since agents and forces can be associated with a distinct causing sub-event they are possible, while goals and experiencers are not.[18] On this account, the suppression of external arguments, as in nominal passive, and the addition of external arguments, as in nominal 'by', show the same restricted distribution because they are sensitive to event boundaries in the same way. If so, the restrictions on nominal 'by' follow from the general pattern of argument introduction and suppression in nominals generally, not from any special property of 'by' itself.

If the generalization across nominal passive and by-phrase restrictions is correct, it follows that verbal and nominal 'by' are no different, and that neither of them makes a semantic contribution. Nominal 'by' is constrained to express material at event boundaries, by either introducing material, or by realizing implicit agents or forces. If correct, another conclusion may follow. Given the sensitivity of nominals to event boundaries, it might be possible to attribute the implicit agent in active derived nominals (see (45)–(46)) to the suppression of the entire causing sub-event, rather than to the suppression of an individual argument. Whereas individual arguments can be manipulated (introduced, suppressed, or left out) in the verbal domain, only event constituents can be manipulated in the nominal domain.[19] If so, the view that external arguments are adjuncts may be correct, and the view that agents (and sometimes forces) are arguments may also be correct, and the division correlates with event-boundaries.

An understanding of why morphological identity across active and passive has the effect of allowing separability only at event boundaries cannot be answered without a detailed specification of the syntax underlying morphological identity in nominals. Nevertheless, it seems reasonable to assume that separation of the causing sub-event in nominal passive, and its addition, within the by-phrase, are governed by the same principle, and that the principle is indeed related to the syntax-morphology of Voice and its absence.

[18] Subject to event co-temporality and event identification along the lines proposed for pre-nominal genitives and producing the distribution of inanimates in (48).

[19] Recalling, to some extent, the view in Dowty (1989) that argument association in the verbal domain reflects the ordered-argument strategy and in nominals it is Davidsonian.

5. Complex Events in ING-OF nominalizations

The major and most well known division within the class of nominalizations is between those in which accusative case is not assigned and modification is adjectival, and those in which accusative case is assigned and modification is adverbial, as in ACC-ING and POSS-ING gerunds. In the latter group, the morpho-syntactic restrictions observed in derived nominals (see 1–4 above) are neutralized and the full gamut of verbal constructions is observed, including ECM, double objects, object control and particle shift. Here I focus on a more subtle division within the first class, the division between derived nominals and ING-OF gerunds, and argue that differences between these types can be understood in terms of event complexity: ING-OF nominalization appears to license complex events. If correct, there are two kinds of deficiency in nominals, a morpho-syntactic deficiency and a temporal deficiency (which may have additional morpho-syntactic effects). ING-OF nominalizations share morpho-syntactic deficiency with derived nominals, and also share with other gerunds a larger event size which allows them to host complex events, including lexical causatives and resultatives with adjectives and particles.

Many of the examples considered to have (indirect) CAUSE subjects given in Pesetsky (1995) and Harley and Noyer (2000) improve substantially in ING-OF nominalizations (noted in passing in Harley 2008):

(49) a. # Bill's growth of tomatoes
b. Bill's growing of tomatoes
c. # Inflation's shrinkage of his salary
d. ? Inflation's shrinking of his salary

(50) a. # Adultery's separation of Jim and Tammy Faye
b. ? Adultery's separating of Jim and Tammy Faye
c. ? The cold war's separating of East and West Germany
d. # The 19th century's unification of the principalities
e. ? The 19th century's unifying of the principalities

The examples in (50) have been analyzed in section 3 as containing non co-temporal causes. A similar improvement is observed for the derived nominals with non-co-temporal causes introduced in section 3:

(51) a. # The exercise's expansion of her interest in syntax
b. ? The exercise's expanding of her interest in syntax
c. # The weather's alteration of their plans
d. ? The weather's altering of their plans

The improved status of non-co-temporal CAUSES in ING-OF nominalizations suggests that the requirement for a simple event is neutralized in ING-OF, and that these types of nominalization differ in terms of the event-structures they can host. Since there is no requirement for reduction to a simple event via event- identification, the main event may be construed as triggered by a non co-temporal causing event. Further support for a temporal treatment of the improvement in ING-OF is provided by lexical causatives in which non co-temporality is made explicit. The following examples are presented in Levin and Rappaport Hovav (2002) to illustrate temporal independence in lexical causatives. The act of putting arsenic in the coffee, in (52a), does not extend to the point of death, and in (52b) the banging may have been protracted but the breaking is punctual:

(52) a. The widow murdered the old man by putting arsenic in his coffee
b. Casey's persistent banging broke the window

Lexical causatives in which the CAUSE is explicitly not co-temporal with the result state produce good ING-OF nominalizations:[20]

(53) a. the waking of the baby by playing the piano
b. the shocking of Sandy by deciding to run for office
c. the murdering of the old man by putting poison in his soup
d. the wind's eventual shutting of the door

Thematic approaches to agent exclusivity, in which the restriction in derived nominals is attributed to the absence of Voice^{o} (the head which intro-

[20] Simple DPs which denote causing events cannot be easily expressed within a by-phrase. The by-phrase counterparts to (49) and (50) in (ia) and (iia) are substantially worse, compared to a gerund within the by-phrase, as in (52) and (ib), (iib).

(i) a. #the separating of Jim and Tammy Faye by adultery
b. the separating of Jim and Tammy Faye by committing adultery
(ii) a. #the justifiying of the evacuation by the hurricane
b. the justifiying of the evacuation by describing the hurricane

In the good cases the subject of the gerund is controlled by the implicit external argument, showing that when the external argument is implicit, it must be agentive, in ING-OF nominalizations as in derived nominals. This suggests that event complexity in ING-OF nominalizations is produced by syntactic augmentation, and is subject to a syntactic constraint: results and non co-temporal causes may be added in the course of the derivation to the simple event-structure characteristic of derived nominals, but only within the basic structure of DP and not within a by-phrase.

duces external arguments), could certainly claim that ING-OF nominalization does include a Voice^{o} projection. The cost of this approach is not so much a loss of Burzio's generalization (since adjectives too take external arguments and fail to assign accusative), as a blurring of the content of Voice^{o}. This is because the status of implicit arguments in ING-OF nominalizations is no different from their status in active derived nominals, however analyzed (see for example the different views presented in Kratzer 1996 and Kratzer 2002). But if the presence vs. absence of Voice^{o} doesn't lead to a contrast in the syntactic presence of implicit external arguments, it is no longer clear what else to expect from the presence or absence of Voice^{o}.

An analysis in terms of event complexity predicts additional effects not expected on a thematic analysis which focuses exclusively on the external argument. In particular, it is expected that ING-OF nominalizations should be better than derived nominals when it comes to complex events created by the addition of an endpoint or result. Activity verbs augmented by the addition of adjectival predicates or particles produce complex events and in these cases the shift from a simple event to a complex event has no effect on the external argument. To the extent that ING-OF nominalizations license complex events, these are expected to be possible.

More specifically, temporal independence and event complexity distinguish between adjectival resultative constructions with and without selected direct objects (Levin and Rappaport Hovav 1999, 2002). Resultatives with a single selected argument entail co-temporality of the activity denoted by the verb and progression towards the result denoted by adjective, whereas resultatives with non-selected direct objects allow temporal independence between the two sub-events. The steaming and the boiling in the bare XP resultatives in (54a) and (54b) must be co-extensive with the becoming dry. In (54c) and (54d), which include a non-selected direct object, the screaming and the walking do not have to be co-extensive with the becoming hoarse or tired.

(54) a. The clothes steamed dry on the radiator
b. The kettle boiled dry
c. The fans screamed themselves hoarse
d. The tourists walked themselves tired

Resultatives with non-selected direct objects provide an example of a complex event in which the sub-events are temporally independent, and choice of external argument plays no particular role. Resultatives with non-subcategorized direct objects should be possible in ING-OF nominalizations, and they are:

(55) a. The joggers ran the pavement thin
b. the running of the pavement thin
c. The dog barked the neighbor awake
d. the barking of the neighbor awake
e. the rubbing of the tiredness out of their eyes
f. the scrubbing of her hands raw
g. the singing of us all to sleep

These examples illustrate quite clearly that ING-OF nominalizations can host complex events in which the sub-events are temporally independent. It is also quite clear that the acceptability of resultatives with non-selected objects could not be due to a purely morpho-syntactic property which would allow resultatives on an ECM-type analysis (Hoekstra 1984), since ECM and the gamut of constructions associated with structural accusative Case are generally impossible in ING-OF as in derived nominals (recall 1–4 above). The acceptability of these resultatives in ING-OF actually militates against an ECM / Raising to Object syntactic treatment of resultatives with non-selected objects.

Consider finally the particle construction. Since particles add a result ingredient to an activity, they give rise to complex events, a natural candidate for acceptability in ING-OF nominalization. Harley and Noyer (1998) and Harley (2008) have shown that ING-OF nominalizations, unlike ACC-ING and POSS-ING gerunds, do not allow particle shift. From the perspective of this study, it is of immediate interest that ING-OF allows particles at all since derived nominals do not. In the particle landscape in (56), ING-OF patterns with other gerunds in allowing a particle, and it patterns with derived nominals in its deficient syntax:

(56) a. *John's explanation (away) of the problem (away)
b. John's explaining (away) of the problem (*away)
c. John's explaining (away) the problem (away)

The difference between the shifted structure in (56c) and its non-shiftability in (56b) can be attributed to the presence of purely syntactically functional material in (56c), but the difference between (56b) and (56a) must have a distinct source since both constructions are equally deficient when it comes to pure morpho-syntax. Given that particles produce complex events, it is likely to be related to the constraint on event complexity.

The role of temporality in determining event complexity in the sense developed in section 3 is illustrated in the following examples with non-selected objects. In (57a) the alleviation of their sorrows need not be coextensive

with the laughing or drinking, and similarly in (57b), where the entrance of the guests typically follows the winking or buzzing. They all produce good ING-OF nominalizations, in (58):

(57) a. They laughed / drank away their sorrows
b. She winked / buzzed in the guests

(58) a. The drinking / laughing away of their sorrows
b. The winking / buzzing in of the guests

The three-way division observed in nominalizations with particles illustrates most succinctly the division of labor argued for here, where pure syntactic factors distinguish between the two major classes, and event complexity distinguishes ING-OF nominalizations from derived nominals.

6. Conclusions

Close examination of the distribution of pre-nominal inanimates in transitive derived nominals leads to the conclusion that restrictions in this domain cannot be defined thematically, only in terms of the properties of participants, and hinge on the significance of the entire event. It has been proposed that above and beyond well-known syntactic limitations in derived nominals, derived nominals are also constrained to host simple, single events. The constraint on event complexity allows any sort of event as long as it is simple. When an instigator is present, its participation must coincide with the beginning of the unfolding event, leading to event identification and the reduction of causatives and accomplishments to single events; this explains why agents and direct causes appear to be privileged in derived nominals. English nominal passive illustrates another option, where only the result component is included. An analysis in these terms has the advantage of eliminating the need to attribute agentivity to the root, including roots which produce inchoatives where no syntactic activity of an external argument is ever detected. It was proposed that the effect in nominals is better captured above the level of the root, as a selection restriction on nominalizing affixes. Whether the restriction is semantic or syntactic remains open to further study, but further constraints on nominal passive and on nominal by-phrases appear to provide preliminary support for a syntactic treatment. Nominal by-phrases are much more restrictive than their verbal counterparts, and these restrictions have been shown to combine two kinds of restrictions. On the one hand, by-phrases are just like the pre-nominal

genitive in excluding causes and forces which cannot be construed as direct participants. This suggests that nominal by-phrases are merged within the minimal event sanctioned in derived nominals, on a par with the pre-nominal genitive. On the other hand, by-phrases show a restriction which seems to be related to the restrictions in nominal passive: nominal passive is impossible when the external argument is an experiencer or goal, and nominal by-phrases cannot host experiencers or goals. If nominal passive is sensitive to event-structure in the ways discussed in section 4, such that severing the external argument can only occur at an event boundary, it would appear that introducing an argument via a by-phrase must also occur at an event boundary. How these two restrictions can be reconciled, and what they suggest regarding the syntax of the event complexity constraint awaits further study.

The claim that there exist event-related constraints on derived nominals, in addition to pure morpho-syntactic ones, explains why there can exist 'mixed nominalizations'. ING-OF nominalizations are similar to derived nominals in morpho-syntactic deficiency, and similar to verbal gerunds in licensing complex events. To the extent that the typology is on the right track, we gain new ground for the study of the syntax-event structure interface and in particular the ingredients which underlie the representation of complex events. The patterns examined above suggest that these ingredients reduce to the minimal difference between ING-OF and derived nominals and point specifically to the contribution of ING. Independently, it has been claimed that ING-OF nominalizations are necessarily restricted to atelic events, much like the verbal progressive, (Snyder 1998; Alexiadou 2001; Borer 1999, 2007), suggesting perhaps an additional event variable and additional structure. How exactly obligatory atelicity and the licensing of temporally complex events are related, how the correlation might be represented, and how event simplicity in derived nominals is represented syntactically await further study.

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Aspect and argument structure of deverbal nominalizations: A split *v*P analysis

Petra Sleeman and Ana Maria Brito

1. Introduction

Deverbal nominalizations maintain, in general, the aspectual properties of the verbs from which they derive, but it has been noticed that some of them can have more than one reading. Grimshaw (1990) distinguishes two types of nominalizations: complex event nouns, in which the properties of the verbal base are still transparent, and result nouns, in which the properties of the verbal base are no longer transparent. Sleeman and Brito (2010) argue that more than two readings can be distinguished for nominalizations. They distinguish five readings, which are connected not only to different aspectual readings, but also to the expression of argument structure.

Building on Larson's (1988) analysis of double object constructions and within a generative-constructivist approach to the relation Lexicon-Grammar applied to the left periphery of the *v*P phase, Ramchand (2008) proposes that *v*P can be split up in various functional projections: Initiator Phrase, Process Phrase and Result Phrase. Although initially built for verbs, we propose in this paper, following Bašić (this volume), that the split *v*P hypothesis can be applied to other categories. In the specific case of nominalizations, we argue that the split *v*P hypothesis can account for the five readings distinguished by Sleeman and Brito (2010).

The paper is organized as follows. In sections 2 and 3, we present some problems for a dichotomy of nominalizations, as defended in Grimshaw's (1990) lexicalist view and in Alexiadou's (2001) syntactic analysis of nominalizations. In section 4, we present Ramchand's split analysis of the *v*P and the verb classes that in Ramchand's analysis lexicalize one or more parts of the split *v*P. In section 5, we argue that Sleeman and Brito's (2010) distinction of five types of nominalization can be motivated on the basis of the split *v*P hypothesis, the verbal root of each type of nominalization lexicalizing a different part of the split *v*P. Finally, in section 6, we summarize the results.

2. The relation between event structure and argument structure in nominalizations: Grimshaw's (1990) view

Deverbal nominalizations maintain, in general, the aspectual properties of the verbs from which they derive, but in the literature it has been noticed that deverbal nominalizations, specially those that are derived from accomplishment verbs, are ambiguous between, at least, an event and a result reading, as illustrated by the following English examples:

(1) The translation of the book took ten years. (event)
(2) John's translation has been published recently. (result)

The event reading emerges when the nominalization occupies the subject position in sentences containing verbs like *to last, to take x time* or in sentences containing verbs that are combined with *during x time*. The result reading is the dominant reading when the nominalization occupies the subject position of psychological verbs or other verbs that denote a property of the result of a previous event.

In a lexicalist view of morphology, Grimshaw (1990) claims that the distinction between an event reading and a result reading of nominalizations is associated with a difference in argument structure: whereas process nouns (i.e. complex event nouns), like *examination*, must take internal arguments, result nouns, like *exam*, are like object/entity nouns and do not select arguments (Grimshaw 1990: 49):

(3) the examination of the papers
(4) *the exam of the papers

To reinforce her theory of nominalizations, Grimshaw (1990: 54) proposes some diagnostics to distinguish event and result nominals:

(i) Only result nouns can pluralize:

(5) two exams
(6) *two examinations of the papers

(ii) Only result nouns can be preceded by an indefinite determiner; the use of indefinites with event nouns is generally not accepted (Grimshaw 1990: 54):

(7) an exam
(8) ?? *an examination of the papers

(iii) Only result nouns can be preceded by a demonstrative determiner:

(9) that exam
(10) *that examination of the papers

(iv) Result nouns combine with possessors, while event nouns combine with agents (Grimshaw 1990: 51):

(11) the instructor's (possessor) exam
(12) a. the instructor's (agent) examination of the papers
b. the examination of the papers by the instructor (agent)

However, the situation seems to be less clear-cut. Work on nominalizations in several languages has shown that there are some phenomena that have to be considered if we want to build a general theory of nominalizations (see also Sleeman and Brito 2010):

(i) Process nominals do not obligatorily take internal arguments:

(13) The discussion lasted two hours.

(ii)In Grimshaw's analysis, result nouns and object nouns are analyzed in the same way: they have no argument structure and no specific theta roles to discharge; they optionally take semantic participants with which they have rather loose relations, among which the possessor relation.[1] However, example (14), which has a clear result reading and where the noun *discussió* 'discussion' is followed by a PP that can also follow the corresponding event noun, shows that result nouns can optionally select an internal argument, contrary to object nouns.

(14) *La discussió de les dades es va publicar a la revista*. (Picallo 1991)
'The discussion of the data was published in the journal.'

(iii) Event nouns can pluralize:

(15) *Die Besteigungen der beiden Gipfel dauerten 6 Wochen*. (Bierwisch 1989 for German, *apud* Alexiadou 2001: 72)
'The climbings of the two tops took 6 weeks.'

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[1] Among the loose semantic relations that can be established between the head noun and complements or specifiers, the following can be distinguished: part/ whole (*the leg of the table*), content (*a book of linguistics*), origin (*le vin de Bordeaux 'the Bordeaux wine'*), material (*une table en bois 'a wooden table'*).

(16) *Tijdens de martelingen van de politieke gevangenen door de zwarte brigades moesten alle journalisten het gebouw uit.* (Van Hout 1991: 75 for Dutch)
'During the tortures of the political prisoners by the black brigades all the reporters had to leave the building.'

(17) *Os jornalistas estavam a assistir a várias destruições de pontes, quando chegaram as tropas*. (Brito and Oliveira 1997: 61 for Portuguese)
'The journalists were watching several destructions of bridges, when the troops arrived.'

(iv) The arguments concerning the form of the determination of the event nominal are not so strong as Grimshaw proposes. Under certain contextual conditions, the nominal may be preceded by an indefinite determiner:

(18) *Os jornalistas estavam a assistir a uma destruição da ponte, quando a bomba caiu*. (Brito and Oliveira 1997: 60)
'The journalists were watching a/one destruction of the bridge, when the bomb fell.'

(v) The combination with a demonstrative with a contrastive effect is also possible:

(19) *Os jornalistas estavam a assistir a essa destruição da ponte, quando a bomba caiu*. (Brito and Oliveira 1997: 61)
'The journalists were watching that destruction of the bridge, when the bomb fell.'

(vi) Certain nominalizations can combine with a genitive representing the agent, even when they have an event interpretation, as observed by Van Hout (1991: 76) for Dutch. According to Van Hout, this can only happen with countable nouns, see the following example in Dutch:

(20) *Ik heb alle uitvoeringen van Youri Egorov van het Schumann-programma bijgewoond*. (event)
'I have attended all of Youri Egorov's performances of the Schumann program.' (event)

And the same happens in Portuguese with nouns like *tradução* (translation):

(21) *A tradução da Odisseia de Frederico Lourenço demorou dois anos.* (event)
'Frederico Lourenço's translation of the Odyssey lasted two years.'

(22) *A tradução da Odisseia de Frederico Lourenço é magnífica*. (result)
'Frederico Lourenço's translation of the Odyssey is very good.'

In fact, this type of nominal (*translation, performance, representation, discussion,* among others), is different from *destruction, construction,* and so on. In the result reading, these nominals easily select an internal argument, as the following example shows (see also 14):

(23) *A tradução de Homero que está em cima da mesa é excelente*.
'The translation of Homer that is on the table is excellent.'

This is possible because these nouns express representations, and therefore they are to a certain extent close to picture nouns. Having the denotation of a representation, they may refer to the real author/origin (the proper noun *Homero* in (23)) and they may also refer to the author of the representation: in *Frederico Lourenço's translation of the Odyssey* the real author is Homer and the genitive, *Frederico Lourenço's*, is just the author of the translation. Consequently, novels, theatre pieces and so on, allow for several representations, several translations. This is why these nouns, which easily select arguments, are countable and allow plurality (Van Hout 1991); in these circumstances they are in between process and object nouns and this is why they allow two genitives.[2]

Furthermore, Brito and Oliveira (1997) show, for Portuguese, that a result noun (as evidenced by the type of predicate) may even be combined with a *by*-phrase expressing the agent (24) and can be used in control constructions (25), differently from concrete nouns (26), contrary to what Grimshaw claims:

(24) *A análise do texto pelo aluno enriqueceu o conhecimento dos colegas*. (result)
'The analysis of the text by the students enlarged the knowledge of the colleagues.'

(25) *A construção do campo de jogos para entreter as crianças trouxe benefícios para a comunidade*. (result)
'The building of the playground to entertain the children benefited the community.'

[2] We thank Ignacio Bosque for this clarification.

(26) **A construção do campo de jogos para entreter as crianças é de boa qualidade*. (concrete object)
'The building of the playground to entertain the children is of good quality'

These examples confirm that result nouns may select arguments and may even be combined with a *by*-phrase, whereas concrete/entity nouns do not have argument structure. This is justified by the proposal that the result noun still has an event structure, as we will see later (see also Brito and Oliveira 1997 for Portuguese).

Summarizing this discussion, we have shown, contra Grimshaw (1990), that:

- process nominals do not obligatorily take internal arguments;
- process nominals can pluralize and can be combined with an indefinite determiner or a (contrastive) demonstrative;
- some process nominals can be combined with an *of*-phrase instead of a *by*-phrase, (those which are easily countable and that represent something that has a real origin or author normally not expressed);
- result nouns can take internal arguments;
- in certain circumstances result nouns can even be combined with a *by*-phrase or can be used with control verbs.

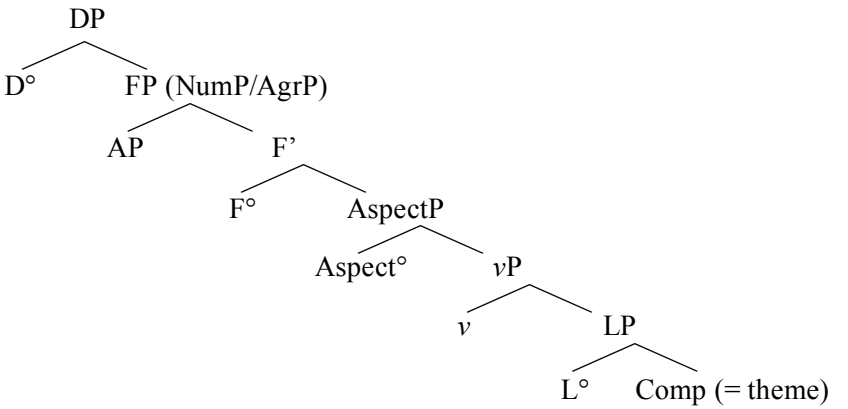
In this section, we have discussed Grimshaw's lexicalist view on the syntactic properties of nominalizations, which states that syntactic properties of nouns, in particular the presence and form of argument structure, is related to the presence or absence of an Event argument in the lexical representation of the nominalization. In the next section, we will discuss the relation between aspect and the syntactic properties of nominalizations in Alexiadou's (2001) syntactic approach to morphology.

3. A syntactic analysis of nominalizations

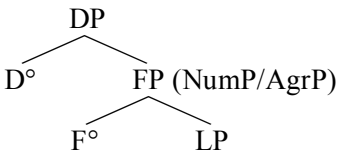
Just like Grimshaw (1990), Alexiadou (2001) assumes that, whereas process/complex event nouns are eventive, result nouns are not. But whereas according to Grimshaw result nouns cannot take arguments because they are not eventive, Alexiadou (2001), following Picallo (1991), shows, on the contrary, that result nouns may take arguments. Alexiadou derives both process nouns and result nouns in Syntax, but claims that the difference between the two types is that whereas the lexical roots of process nouns are

dominated by the functional projections *v*P and AspP (and DP), as in (27), the lexical roots of result nouns are not dominated by these functional projections, but are only dominated by DP, as in (28):

(27)



(28)



Alexiadou argues that, due to the absence of these verbal functional projections, arguments of result nouns do not have to be projected obligatorily, but can be projected optionally. To account for the combination of result nouns with complements, Alexiadou, following Levin (1999), assumes that lexical roots are constants, meaning that the presence of arguments is guaranteed independently of the eventive character of the outcome of word-formation. When constants enter into a relation with event related projections, the presence of arguments becomes obligatory, i.e. they become structure participants in Levin's terms. Since with result nouns there are no *v*P and AspP, the projection of the arguments of the constants is not required, i.e. optional. Although Alexiadou can in this way account for the fact that result nouns can combine with complements, there is still a relation between the presence of event and the projection of arguments. This is the case because Alexiadou relates the fact that complements are obligatory with process nominals to the presence of an eventive functional head, and the fact that complements are optional with result nouns to the absence of an eventive functional head.

Although Alexiadou's syntactic analysis of process nouns in (27) can account for pluralization (15–17) or the use of the indefinite or demonstrative

determiner (18–19), DP and NumP being independent of the type of verbal root, there is still a strong relation between the presence of event and the projection of arguments. Consequently, it is difficult in Alexiadou's framework to explain the fact that process nominals do not necessarily take arguments (see 13). Furthermore, it is not easy to account for the fact that nominals with an event interpretation can combine with a genitive instead of a *by*-phrase (see 20–23), or for the fact that result nouns can combine with a *by*-phrase or can be used in control constructions (see 24–25). Finally, Alexiadou's structure of result nouns (28) does not discriminate them from object nouns. However, they differ in the fact that result nouns optionally take arguments whereas object nouns do not. If the licensing of an argument is a property of a constant, i.e. an intrinsic property of a root, not only its being obligatory or optional should be accounted for, but also its absence.

We therefore need an analysis that more strongly dissociates a process reading from the presence of argument structure and we need a more fine-grained analysis of the aspectual dimension of deverbal nominalizations. This analysis will be developed in the following sections.

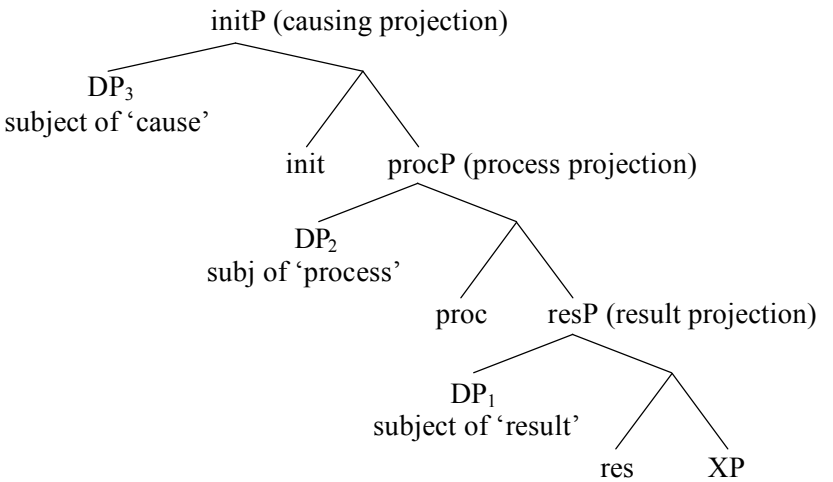
4. Split *v*P

One of the debates of the last twenty years has been the division of labor between Syntax and the Lexicon. Following Hale and Keyser (1993) and more recent related literature, Ramchand (2008) assumes that words are built in Syntax, and that the Lexicon is eliminated as a module with its own special primitives and modes of combination, although she does not deny that there is encyclopedic information that has to be listed/memorized. Since there is no Lexicon and therefore no argument structure as a lexical property, selectional restrictions have to be encoded in another way. Ramchand adopts the view that the syntactic projection of arguments of verbs is based on event structure, associated with the verbal meaning, which she decomposes in three subevental components: a causing subevent (initP), a process denoting subevent (procP) and a subevent corresponding to a result state (resP). These subevents depend on the particular lexical item that projects and can be associated to the contribution of constants in the lexical decompositional system of Levin and Rappaport Hovav (1995).[3] Each of these

[3] A similar approach is proposed by Borer (1998) and subsequent work; these kinds of approaches dispense with Thematic Theory: thematic roles are derived from the information contained in the structure (see 29).

subevents is represented as its own projection, ordered in a hierarchical embedding relation (Ramchand 2008: 39):

(29)



ProcP is the heart of the dynamic predicate. It is present in every dynamic verb. The initP exists when the verb expresses a causational or initiational state that leads to the process. The resP only exists when there is a result state explicitly expressed by the lexical predicate. Using the copy theory of movement, copying heads, Ramchand (2008: 63–89) accounts for the presence of several subevents at the same time present in one verb:

(30) Karena drove the car. (Initiation-Process verb)
(31) Alex ran. (Initiation-Process verb)
(32) The ice melted. (Process verb)[4]
(33) Michael arrived. (Process-Result verb)
(34) The glass broke. (Process-Result verb)

Intransitives can become transitive by merging an initP on top of procP:

(35) The sun melted the ice.
(36) Michael broke the glass.

[4] For Ramchand it is crucial that verbs like *to melt* have an intransitive source that is "converted" into a transitive verb by merging an initP (see below). For a different view see Reinhart (2000), for whom these verbs are transitive and are "converted" into intransitive ones by a Reduction Rule in the Lexicon. We will not develop this issue here.

Sometimes a verb is ambiguous in interpretation. Semelfactives like *jump* are a case in point. They can be [init, proc, res], in which case they are punctual and describe a transition ('Michael jumped into the water'), or they can be [init, proc], in which case they are atelic and describe a durative, indefinitely iterated process ('Michael was jumping all the time in the water'):[5]

Each of the subevents licenses an argument in its specifier position. InitP licenses the external argument ('subject of cause' = Initiator), procP licenses the entity undergoing change or process ('subject' of process = Undergoer), and resP licenses the entity that comes to hold the result state ('subject' of result = Resultee):

(37) *John* persuaded Mary. (Initiator)

(38) *The key* opened the lock. (Initiator)

(39) Karena drove *the car*. (Undergoer)

(40) *The ball* rolled. (Undergoer)

(41) Alex handed *her homework* in. (Resultee)

(42) Michel threw *the dog* out. (Resultee)

The Resultees in the previous examples are at the same time Undergoers. Using the copy theory of movement, copying arguments, Ramchand's system analyses composite roles of arguments:

(43) *Karena* ran to the tree. (Undergoer-Initiator)

(44) Katherine broke *the stick*. (Resultee-Undergoer)

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[5] As is well known, the nature of the objects, temporal/aspectual adverbs and auxiliaries sometimes reinforces (i) and sometimes modifies (ii) the aspectual value of the sentences, showing the compositional semantic nature of grammatical aspect:

(i) Katherine broke the stick (in some minutes) ("accomplishment")
(ii) Alex ran a marathon (in 4 hours) ("accomplishment")

According to Ramchand, this does not mean that for verbs as in (ii) *resP* exists, i.e. "*resP* only exists if the event structure itself is specified as expressing a result state." (2008: 40). And she writes: "conversely, the expression of result can be further modified by auxiliaries, PPs etc. outside the first phase syntax to create predications that are atelic, but this will not warrant the removal of *resP* in the syntactic representation". That is, for this author, *resP* only exists in the syntactic structure "when there is a result state explicitly expressed by the lexical predicate" (2008: 40).

In the next section, we argue that this approach – a constructivist-generative approach to the relation Lexicon-Grammar – can be applied to other categories than verbs, in particular nominals; as for nominalizations, the combination of various subevents can account for the various readings of nominalizations and can solve some of the problems that are raised by the classical analysis of deverbal nominalizations not only in a lexicalist (Grimshaw) but also in a syntactic (Alexiadou) analysis.

5. Nominalizations

Arguing against the Lexicalist approach (e.g. Chomsky 1970; Grimshaw 1990), various linguists (e.g. Picallo 1991; Borer 1998; Harley and Noyer 1998; Van Hout and Roeper 1998; Alexiadou 2001), have proposed that nominalizations, being deverbal categories, are built in Syntax. In this section, following Sleeman and Brito (2010), we adopt this approach. We argue that nominalizations can have different readings and different possibilities of realization of their argument structure and we relate the various readings to various differences within Ramchand's split *v*P.

5.1. Five types of nominalizations

Sleeman and Brito (2010) reject Grimshaw's and Alexiadou's strict dichotomy between process nouns and result nouns, which is based on the presence vs. absence of event structure or event related functional projections. Whereas Grimshaw and Alexiadou seem to relate result nouns to object nouns such as *book*, Sleeman and Brito (2010), based on Brito and Oliveira (1997), distinguish the two types of nouns from one another. Since result nouns are the result of an event, result nouns are eventive in their view, whereas object nouns are not. Furthermore, they distinguish two types of eventive nominalizations: one type in which an agent is implied and another type which is not agentive. In this way, Sleeman and Brito distinguish five types of nominalizations: two types of eventive nouns (one licensing a *by*-phrase and the other one not), each with a corresponding result phrase and the object noun as the fifth type.

Building on Alexiadou (2001), Sleeman and Brito (2010) associate the differences between the five types with a difference in the presence and nature of functional categories within DP. In their view, the nominalization process is a gradual process in which the nominalizations become more and

more "nouny", which is reflected in the presence/absence and the changing properties of *v*P and AspP:

(I) – In the most 'verbal' reading of the nominalization, the lexical root takes two arguments (an obligatory *of*-phrase, the complement, and an optional *by*-phrase): *v*P is agentive and eventive, AspP is present and contains an (im)perfectivity feature.

In Alexiadou's approach, the fact that the complement is obligatory results from the presence of *v*P. In Sleeman and Brito's (2010) approach, it results from the agentivity of *v*. As in the case of verbal passives, the agent does not necessarily have to be expressed:

(45) They were watching the destruction of the bridge (by the soldiers).

Brito and Oliveira (1997) show, for Portuguese, that, in certain circumstances, a result noun may be combined with a *by*-phrase expressing the agent (46) and can be used in control constructions (47), which shows that this reading is still eventive and agentive. In Sleeman and Brito's (2010) analysis, this is the corresponding resultative reading of (45). They assume that in the corresponding resultative reading, Asp contains the feature Result instead of an (im)perfectivity feature, other things being equal to (I):

(46) *A análise do texto pelo aluno enriqueceu o conhecimento dos colegas*. (result)
'The analysis of the text by the students enlarged the knowledge of the colleagues.'

(47) *A construção do campo de jogos para entreter as crianças trouxe benefícios para a comunidade*. (result)
'The building of the playground to entertain the children benefited the community.'

(II) – The second stage is as in (I), but the agent-like participant, when present, is expressed by a genitive: *v* has lost the feature Agentive. The lexical root optionally takes an internal argument.

Following Alexiadou, Sleeman and Brito (2010) assume that, as a constant, the lexical root can take an internal argument. Alexiadou relates its optionality to the absence of *v*P. In Sleeman and Brito's (2010) approach, *v*P is still present in this reading, which explains the possibility of the expression of an agent-like participant by a genitive. They relate the optionality of the

internal complement, as in (48), an example from Dutch taken from Van Hout (1991), to the absence of the agentivity feature on *v*:

(48) *Ik heb alle uitvoeringen (van Joeri Egorov) (van het Schumann programma) bijgewoond*.
'I have attended all of Youri Egorov's performances (of the Schumann program).'

Just as in stage (I), in stage (II) Asp can also contain the feature Result, indicating that we are dealing with the result of an event, the difference with stage (I) being that *v* is not agentive in stage (II). This is illustrated by the Catalan example (49), taken from Picallo (1991):

(49) *La discussió de les dades es va a publicar a la revista*. (result)
'The discussion of the data was published in the journal.'

(III) – The third stage of the nominalization process is reflected by object/entity nouns (*this beautiful building*). There are no arguments, there is no *v*P, no AspP, just as with nouns like *book*.

Sleeman and Brito (2010) assume that in a type of eventive nouns distinguished by Grimshaw (1990), viz. nouns denoting a simple event (*trip*, *race*), the eventive meaning is part of the meaning of the lexical root itself. They are like object nouns: there are no arguments, there is no *v*P and no AspP.

In this approach, Sleeman and Brito (2010) attribute the different properties of the nominalizations to the presence/absence and the changing properties of *v*P and AspP, building on Alexiadou (2001)'s approach, where *v*P is equivalent to VoiceP and AspP contains an (im)perfectivity feature or the feature Result.

In more recent work, Alexiadou (e.g. 2008) distinguishes three verbal functional projections instead of two. Besides *v*P and AspP she distinguishes VoiceP, dissociating *v*P from VoiceP (Kratzer 1994).

Although these functional projections come close to Ramchand's split *v*P (initP ~ VoiceP, procP ~ *v*P and resP ~ AspP), in this paper we try to account for the various readings of nominalizations within Ramchand's split *v*P hypothesis, and not within Alexiadou's VoiceP – *v*P – AspP approach for the following reasons. First, in Alexiadou's system the presence of an agent is related to the presence of VoiceP. However, with nominalizations agents can be absent, as in Sleeman and Brito's stage II of the gradual process of nominalization presented above, but (passive) Voice still seems to be present. Second, in the split *v*P approach there is a more natural relation be-

tween the intrinsic meaning of the verb and the presence of verbal functional projections than in Alexiadou's system. Third, for the same reason, the presence of precisely three functional verbal projections within *v*P distinguished by Ramchand is motivated in her analysis.

In the next section, we will show that the splitting up of *v*P in three subparts can account in a natural way for the five readings of nominalizations distinguished by Sleeman and Brito (2010).

5.2. Nominalizations and the split vP hypothesis

In the previous section, we discussed Sleeman and Brito (2010), who argue that result phrases are still eventive in some sense, because they represent the result of an event. In Sleeman and Brito's analysis, this means that *v*P is still present, which distinguishes them from object nouns. This also distinguishes them from simple event nouns (*trip*, *race*) in their analysis, because they assume that the eventive meaning of these is part of the meaning of the lexical root itself. Sleeman and Brito distinguish two types of "complex" event nominals: one which can be combined with a *by*-phrase, and one which can only be combined with an *of*-phrase as the "agent". In total, Sleeman and Brito distinguish five values of nominalizations.

In section 4, we showed that Ramchand distinguishes four aspectual readings for verbs and that these correspond to the combination of the three subcomponents of *v*P that she distinguishes, initP, procP and resP, with procP always being present, being the heart of the dynamic predicate. These four verb types are: Initiation-Process verb, Initiation-Process-Result verb, Process verb and Process-Result verb.

In Ramchand's system, verbs are constants, which means that each verb is always represented by the same set of verbal functional projections. There are two major exceptions, as noted in section 4. First, intransitive verbs such as *melt* (process) can become transitive by the merging of an initP on top of procP. Second, semelfactives like *jump* are inherently ambiguous between [init, proc] and [init, proc, res].

For nominalizations, we adopt the idea expressed in Alexiadou (2001) and other analyses of nominalizations within a syntactic approach to morphology (e.g. Van Hout and Roeper 1998) that the nominalization is created somewhere in the course of the merging process, either by the merger of nominal functional projections or by the merger of *n*P (Marantz 1997) and that the final realizations of nominalizations derive from post-syntactic

rules that give the adequate morphological form to the nominals, specifically that give the final form to the nominal suffixes.

We propose that, within a split *v*P analysis, nominalization can take place above resP, above procP, or above initP. This means that in nominalizations less parts of split *v*P can be present than would be required by the intrinsic constant meaning of the verbal base.

Bašić (this volume) also adopts Ramchand's split *v*P hypothesis. Just like Ramchand, she assumes that verbs can be associated to several functional heads at the same time. Bašić claims that with complex event nominals the verbal root lexicalizes initP, procP and resP at the same time, that with simple events the verbal root lexicalizes procP and resP, and that with result nouns the verbal root lexicalizes only resP. This means that for nominalizations Bašić also allows subparts of *v*P, such as resP, to be lexicalized.

In this section, we propose that the five nominalization types distinguished in the previous section lexicalize different parts of Ramchand's split *v*P.

We distinguish five interpretations for nominalizations, instead of the three distinguished by Bašić, and propose that they lexicalize different parts of split *v*P: nominalization can take place above resP, above procP + resP, or above initP + procP + resP. Although with verbs procP is always present, we claim that with nominalizations this is not compulsory, especially with non-eventive nominalizations (resP). Since we assume that nominalizations can be ambiguous between a resultative and a non-resultative interpretation, we propose that in addition to the three subparts of *v*P already distinguished, also procP and initP + procP can be lexicalized within the nominalization. With these five subparts of *v*P the five readings of nominalizations Sleeman and Brito (2010) distinguish can be accounted for:

stage I (non-resultative):

(50) They were watching the destruction of the bridge (by the soldiers). (initP-procP) (=45)

stage I (resultative):

(51) *A análise do texto pelo aluno enriqueceu o conhecimento dos colegas*. (initP-procP-resP) (=46)
'The analysis of the text by the students enlarged the knowledge of the colleagues.'

Both cases are associated to an argument structure with a theme argument (= Undergoer) and an agent argument (= Initiator).

Although plural is not very natural in these readings, it is not excluded, because there can be a plurality of events, as in the examples (15)–(17), repeated here as (52)–(54):[6]

(52) *Die Besteigungen der beiden Gipfel dauerten 6 Wochen*. (Bierwisch 1989 for German, *apud* Alexiadou 2001: 72)
'The climbings of the two tops took 6 weeks.'

(53) *Tijdens de martelingen van de politieke gevangenen door de zwarte brigades moesten alle journalisten het gebouw uit.* (Van Hout 1991: 75 for Dutch)
'During the tortures of the political prisoners by the black brigades all the reporters had to leave the building.'

(54) *Os jornalistas estavam a assistir a várias destruições de pontes, quando chegaram as tropas*. (Brito and Oliveira 1997: 61 for Portuguese)
'The journalists were watching several destructions of bridges, when the troops arrived.'

stage II (non-resultative):

(55) *Ik heb alle uitvoeringen (van Joeri Egorov) (van het Schumann programma) bijgewoond*. (procP) (=48)
'I have attended all of Youri Egorov's performances (of the Schumann program).'

InitP being absent, there is no *by*-phrase, but there is a possessor (in the nominal functional projections), which has an agentive flavor, because of the eventive character of the nominalization expressed by procP and the suppression of InitP. The initiator of the event being absent, the merger in Spec, procP of the other participant in the event, the Undergoer, is not compulsory either.

stage II (resultative):

(56) *La discussió de les dades es va a publicar a la revista*. (procP-resP) (=49)
'The discussion of the data was published in the journal.'

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[6] Correlatively, the nominal functional projections can contain determiners different from the definite article, such as an indefinite determiner or a demonstrative, independently of the eventive character of the nominalization.

For the nominalization of stage III, we propose that it simply contains resP. Although procP is the heart of the dynamic predicate and therefore is present in all of the four verb types that Ramchand distinguishes, we propose that procP is absent in stage III nouns, because they are not eventive. They are the most 'nouny' of the five types. Since there is only resP, but no procP, there can be no Undergoer :

stage III (object noun that expresses the result)

(57) this beautiful building (resP)

(58) Read this publication on-line. (resP)

The distinction between five types of nominalizations is thus naturally motivated by Ramchand's split *v*P hypothesis, with extra assumptions made for nominalizations.

6. Conclusion

In this paper we have independently motivated the assumption made by Sleeman and Brito (2010) that for nominalizations five readings can be distinguished. In Sleeman and Brito's (2010) syntactic approach to morphology, these different readings are reflected in different syntactic structures for each of the five types, more specifically in different features attributed to *v*P and AspP, and in the presence/absence of *v*P and AspP, dominating the lexical root of the deverbal category. In this paper we have shown that the verbal root of the five types corresponds to five different combinations of Ramchand's (2008) split *v*P, which is composed of functional heads representing certain features of AspP and *v*P used in earlier analyses of nominalizations.

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Post-nominal genitives and prepositional phrases in German: A uniform analysis

Torgrim Solstad

1. Introduction

Adnominal genitives and prepositional phrases (PPs) have a wide range of interpretations. For instance, they may be interpreted as arguments of an event nominalization or a relational noun. They may also express possession or some general associative relation, cf. the German Determiner Phrases (DPs) in (1):

(1) a. *die Zerstörung der / von der Stadt*
the destruction the-GEN / of the city
'the destruction of the city'

b. *die Schwester des Angeklagten*
the sister the-GEN defendant
'the sister of the defendant'

c. *der Rechner meines Kollegen*
the computer my-GEN colleague
'the computer of my colleague's'

In (1a), both the genitive *der Stadt* ('of the city') as well as the *von* ('of') phrase have a preferred interpretation as the object of destruction, whereas in (1b), the genitive *des Angeklagten* ('of the defendant') is most likely to be interpreted as the sibling of the individual referred to by *Schwester* ('sister'). In (1c), the noun phrase *meines Kollegen* ('of my colleague's') is preferably interpreted as the possessor of the computer, or otherwise associated with it, e.g. as someone using it or similar.[1]

There is broad consensus in the literature on adnominal genitives that their interpretation in e.g. (1a) and (1b) is restrained by the head noun of

[1] It may be noted that whereas the same morphological genitive may be used in all cases in German, English has two post-nominal constructions corresponding to the German post-nominal genitive: *of* phrases and double genitives, such as *of my colleague's* in (1c). See also endnote no. 4.

the complex DP, the event noun *Zerstörung* ('destruction') and the relational noun *Schwester* ('sister'), respectively. This can be accounted for by analyzing event nouns and relational nouns as involving argument relations. Similarly, there is widespread agreement that the relatively free relation between the genitive *meines Kollegen* ('of my colleague's') and the head noun *Rechner* ('computer') in (1c) is due to the lack of an argument relation in *Rechner*, which is neither eventive nor relational.

In a number of analyses, the difference between the interpretation of a genitive as corresponding to a theme or agent argument of a verb underlying a de-verbal nominalization on the one hand – henceforth referred to as the theme and agent arguments of the nominalization – and the interpretation of a genitive as a possessor or as more broadly associated with the noun in question, is also assumed to have a syntactic correspondence: The semantic behaviour is accounted for not only by referring to the fact that nominalizations such as *destruction* involve an agent or theme argument semantically, whereas nouns such as *computer* have no arguments, but also by assuming different syntactic positions in these two cases. Thus, for instance, for genitive theme arguments, a syntactic position parallel to that of the direct object of verbal projections is assumed (correspondingly, a separate position may be assumed for agent arguments). For possessives or other associative genitives, however, a different position is assumed, possibly as a sister of a nominal head or adjoined to the noun phrase. This approach is most prominently pursued in work in Distributed Morphology (DM; cf. e.g. Alexiadou 2001).[2]

While I do not dispute the basic semantic insights concerning the above data, I take a different view on the syntax-semantics interface in arguing that in German, post-nominal genitives should all be analyzed uniformly syntactically as well as semantically. More concretely, I assume that there is no syntactic argument position for post-nominal genitives. Instead, they are analyzed as Nominal Phrase (NP) adjuncts in a surface-oriented approach to syntax. The genitives may still be interpreted as arguments semantically, although they are introduced by the same underspecified semantic relation in all cases. The interpretational variation between agents, themes and possessors is due to the fact that the underspecified semantic

[2] Similar syntactic and/or semantic dichotomies may be found in other approaches as well. Thus, Hartmann and Zimmermann (2002) use the terms *syntactic genitive* and *semantic genitive*, Barker (1995) makes a parallel distinction between *lexical* and *extrinsic possession*, whereas Partee and Borschev (2003) speak of *inherent* and *free* readings.

representation of the genitive may relate differently to the various NPs to which it is adjoined. I also show how the post-nominal PP realization of arguments may be handled in this approach.[3]

The main claims of my approach may be summarized as follows:

- All post-nominal genitives and PPs are adjoined to NPs, assuming DP to be the highest functional projection dominating a noun phrase.
- All post-nominal genitives are represented semantically by the underspecified two-place relation ρ (rho). Being underspecified, this relation may be instantiated differently, which is what gives us the different interpretations of post-nominal genitives. For PPs the semantic picture is somewhat more diverse, but still compatible with this assumption.

My main goal is to show that a uniform semantic analysis is possible for the phenomena under discussion without the complex syntactic machinery which is often assumed. Since I focus only on German data, I have to leave the discussion of an application of the analysis to other languages for future research.[4]

The paper is organized as follows. In Section 2, I present the details of the syntactic analysis, discussing the alternatives sketched above and providing motivation for the approach I pursue. In Section 3, the semantics of

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[3] I should hasten to add that I will exclude PP complements such as the *an* phrase in (i):

(i) *der metabolische Bedarf des Hundes an Vitamin K*
the metabolic need the-GEN dog for vitamin K
'the metabolic need of dogs for vitamin K'

The group of de-verbal nominalizations with which PP complements co-occur is almost exclusively made up of so-called stem nominalizations, i.e. affix-less nominalizations of the verb stem, which do not constitute a productive pattern in contemporary German. However, see endnote no. 12 for a brief discussion of how they fit into my analysis.

[4] Let me point to one of the differences between e.g. German and English which would have to be taken into account: In English, postnominal arguments and non-arguments are not realized the same way. Arguments are introduced in an *of* phrase, while non-arguments are introduced by means of a double genitive such as in *the stick of John's* (cf. **the stick of John*). From this, one could conclude that German and English cannot be analysed uniformly (see the discussion in Partee and Borschev 2003). However, I would like to emphasize that I do not think it is justified to refute a uniform analyses of genitives in German based on the situation in English.

post-nominal genitives and argument-introducing PPs is presented in detail. Section 4 concludes the paper.

2. A surface-oriented syntax for German DPs

In this section, I explore some important aspects of the syntax of German DPs, motivating the assumption of a uniform syntactic analysis for post-nominal genitives and argument-introducing PPs. I focus on DPs which embed NPs that are headed by (event) nominalizations derived by means of the suffix *-ung* (sharing properties with e.g. both *-ation* and *-ing* in English).[5]

Such nominalizations are mostly thought of as being de-verbal, inheriting the selectional properties of the underlying predicate (for details on *-ung* nominalizations cf. e.g. Ehrich and Rapp 2000; Roßdeutscher and Kamp 2010): For instance, *Anmeldung* ('registration') may be assumed to be derived from *anmelden* ('to register'). For reasons of space, I only discuss those features of the structure of these DPs that I see as relevant for the semantic analysis which is presented in Section 2. I merely briefly touch upon issues of case marking and I also ignore any functional projections below DP such as Number or Gender Phrases (cf. Alexiadou 2001).

In German, genitives may be post- or pre-nominal. My analysis is restricted to post-nominal genitives since in German pre- and post-nominal genitives have differing distributions: Pre-nominal genitives may be argued to be restricted to involving personal names in Modern German (cf. Hartmann and Zimmermann 2002: 174, and references therein).[6]

On the other hand, I also include such post-nominal PPs which may be associated with the arguments of a nominalization, namely *von* ('of') and *durch* ('by') phrases (excluding PP complements, see endnote no. 3):[7]

(2) a. *die Plünderung der / von der Tankstelle durch Punks*
the looting the-GEN / of the petrol station by punks
'the looting of the petrol station by punks'

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[5] The limitation to *-ung* nouns is to a large extent a practical matter. It may be noted, though, that e.g. Alexiadou, Anagnostopoulou and Schäfer (2009) do not assume that eventive, nominalized infinitives share all the properties of *-ung* nominalizations.

[6] See Sternefeld (2007: 212) for a different view.

[7] I should hasten to add that *durch* phrases also have other interpretations which are not considered in this paper. They may for instance specify paths or causers. See Solstad (2007a, 2007b) for details.

b. *die Anmeldung der Kinder durch ihre Mütter*
the registration the-GEN children by their mothers
'the registration of the children by their mothers'

As already stated in Section 1, I treat both the genitives as well as the *von* and *durch* phrases as NP adjuncts. Thus, the DP in (2a) is assigned a structure as in Figure 1 (shown only for the genitive, see the comments on the relation between genitives and *von* phrases below, especially in the discussion of example (7)). Importantly, in the case of a DP such as in (1c), the non-argument genitive *meines Kollegen* is assumed to occupy the same position as the argument genitive *der Tankstelle* in Figure 1.

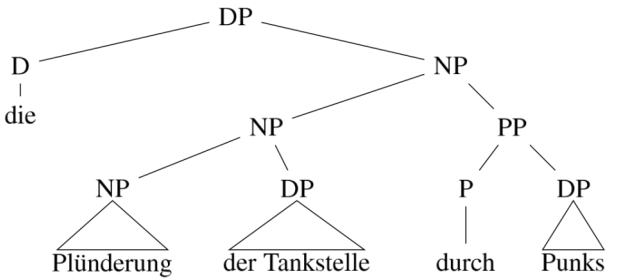


Figure 1. Genitives and prepositional phrases adjoining to NP

It should be noted that an adnominal genitive can only semantically modify a nominal phrase to which it is strictly adjacent. Consequently, the theme argument interpretation of the genitive in (2a) cannot be preserved if the order of the *durch* PP and the genitive phrase is reversed, cf. (3):

(3) *die Plünderung durch Punks der Tankstelle*
the looting by punks the-GEN petrol station
'the looting by punks from the petrol station'

In (3), the genitive *der Tankstelle* ('of the petrol station') may only be interpreted as the petrol station with which the punks are somehow associated, possibly as the station where they hang around, but crucially not as the theme argument of the nominalization *Plünderung* ('plundering'). One may thus assume that the DP *der Tankstelle* is adjoined to the NP *Punks* ('punks') as part of the *durch* phrase. Consequently, a formalization of this strict adjacency constraint should make reference to the linear order of two noun phrases. See Frank (2003) for an implementation in the surface-oriented framework of Lexical-Functional Grammar.

As mentioned above, I treat post-nominal *von* phrases and genitives as equivalent in German, reducing *von* to a case marker. This is motivated by the fact that since in general no case marking is allowed on bare nouns in German, *von* sometimes has to be used instead of the genitive, as e.g. in some occurrences of mass nouns. This view is certainly somewhat too simplified, but I cannot go into this issue in great detail. See, however, the remarks on PP attachment and c-command in the discussion of example (7) below.

Case marking is assumed to be structural, genitive case being assigned in a uniform way to the DPs strictly adjoined to a NP. Thus, there is no differentiation with respect to case assignment for arguments and non-arguments, respectively (see the below remarks on case assignment in Distributed Morphology for a different approach).

Before discussing the motivation for my own approach, some further remarks on Distributed Morphology analyses and the arguments for assuming different syntactic positions for theme, agent and possessor genitives are in place. One of the main motivations behind the claim that Verbal Phrases (VPs) and DPs involving arguments should be treated in parallel, is the indisputable fact that de-verbal nominalizations share a number of features with the VPs they correspond to. Thus, in German, nominalized infinitives govern accusative case, cf. the DP *den Zylinder* ('the cylinder') in (4a), and for English it has for instance been claimed that *-ation* nominalizations allow adverbs such as *thoroughly* as modifiers, cf. (4b):

(4) a. *das den Zylinder in Drehbewegung Versetzen*
the the-ACC cylinder in rotation setting
'the setting-into-rotation of the cylinder'

b. *His explanation of the accident thoroughly (did not help him)*
(Fu, Roeper, and Borer 2001: 555)

In Distributed Morphology, this is accounted for by assuming that such nominalizations include structures which are verbal in nature. Thus, the nominalizing affix dominates a varying number of verbal projections, cf. the abstract tree structure representation in Figure 2 for the DP in (2a):

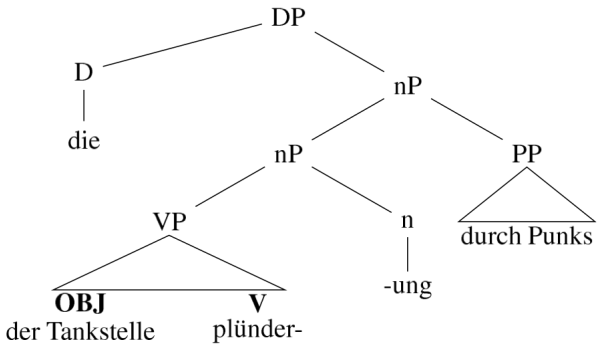


Figure 2. Simplified DM-style structure of de-verbal *-ung* nominalization

In this structure, VP is a shorthand notation for an extended VP, including at least a root Phrase (rP) and (little) vP. In addition, a number of functional projections may be included in the extended VP below the nominalizing n head, depending on the affix in question. Thus, for German, Roßdeutscher and Kamp (2010) assume that *-ung* nominalizations do not include a Voice projection, whereas Alexiadou et al. (2009) argue for the inclusion of VoiceP in "passive" variants of nominalized infinitives, cf. (4a).

Concerning case marking, it may be noted that in Distributed Morphology analyses, assignment of genitive case to theme arguments is assumed to be structural, referring to parallel syntactic positions in VPs and DPs in this case as well. The variation in the assignment of accusative or genitive case is taken to be dependent on the absence or presence of a Determiner head, respectively (although the case feature itself may be located within other projections dominated by the DP, cf. Alexiadou 2001: 177–179). Thus, in Roßdeutscher and Kamp (2010) a DP in the complement position in the root phrase, which would be the lowermost projection under VP, is assumed to be assigned genitive case *in situ*. As for non-arguments such as possessives, slightly different case assigning mechanisms will have to be applied to in Distributed Morphology, since they are not assumed to occupy a VP-internal position. One possibility might be to assume a position adjacent to a nominal head (cf. e.g. Sternefeld 2007: 213–217).

The agentive *durch* phrase is assumed to be adjoined to the level of nP in the DM analysis (A. Roßdeutscher, F. Schäfer, personal communication). In the case of *-ung* nominalizations this is motivated by the above-mentioned claim that no VoiceP is included in the extended VP to which the *-ung* affix applies (Alexiadou et al. 2009; Roßdeutscher and Kamp 2010). Assuming that VoiceP is the only projection in the extended VP within

which an agentive PP may be realized as an adjunct (Solstad 2007a; von Stechow 1996), there is no projection below nP in an *-ung* nominalization to which the *durch* phrase could be adjoined under the premise of structure-sharing between VPs and de-verbal nominalizations. Following the line of argument of Alexiadou et al. (2009), an nP adjunction site should be possible for agentive *durch* PPs, since *durch* is assumed (as in this paper and in Solstad:2007a) to introduce an agent relation on its own. Thus, it needs not be parasitic on an agentive relation introduced by the VoiceP. It should be remarked that this is not an issue which may be considered to be settled in Distributed Morphology.

The challenge to an approach not exploiting any of the mechanisms assumed in Distributed Morphology is to explain how it comes that in German, genitives in DPs and accusative objects in VPs may both be interpreted as theme arguments and that otherwise nominalizations and verbal projections share a number of features. Whereas the next section is devoted to answering the question of parallelism in interpretation, I have nothing much to say about the sharing of features here, which is a task that goes beyond the objective of this paper. It may be noted, though, that under the assumption of structure sharing between VPs and nominalizations, the fact that arguments are not obligatory realized in DPs – an aspect of nominalizations for which there is to my knowledge no convincing explanation (for discussion cf. Alexiadou 2009) – is rather puzzling. Regardless of these issues, we will see below that there exist widely known syntactico-semantic phenomena for which the current adjunction analysis offers a more straightforward explanation than the Distributed Morphology alternative.

What could count as evidence helping us to decide in favour of one or the other structure in Figure 1 and 2? It seems that one of the most prominent arguments for a split syntactic approach is related to the argument or non-argument status of the genitive. While I believe that it is indisputable that we have to differentiate between arguments and possessors in DPs semantically, I do not think that intuitions concerning the argument status of genitives can be considered such evidence alone (cf. Partee and Borschev 2003: 72).

Relevant data to study involve for instance binding, extraction or quantification phenomena. In the following, I focus on binding phenomena. It may be noted that although extraction phenomena are also used for arguing that the theme argument is more deeply embedded than the agent argument (cf. e.g. Godard 1992) – a view which would be incompatible with the claims put forward in this paper – the proper treatment of the extraction data is far from clear. Thus, Kolliakou (1999) shows that there are numerous

counter-examples to the data in Godard (1992) and that they should rather be viewed in light of the distinction between individual and property denotation.

I would like to emphasize that I do not consider the evidence that I present in what follows to be all-decisive with regard to the issue of which syntactic approach should be preferred. Ultimately, the aspects of DP-internal syntax touched upon so far involve theory-architectural issues which will hardly be decided on the basis of any single piece of evidence. However, I contend that the below binding data constitute a real challenge to non-lexicalist approaches such as those within Distributed Morphology. It should be added that these data, although comparable phenomena have been discussed extensively (Jackdendoff 1990; Larson 1988; Pesetsky 1995; Reinhart 1983), are everything else than trivial.

Turning now to the relevant binding data, consider the examples in (5), where the subscript *i* indicates the intended binding relations:[8]

(5) a. *die Anmeldung* [*der meisten Kinder*]$_i$ [*durch ihre*$_i$ *Mütter*]
the registration [the-GEN most children]$_i$ [by their$_i$ mothers]
'the registration of [most children]$_i$ by their$_i$ mothers'

b. **die Anmeldung* [*ihrer*$_i$ *Kinder*] [*durch* [*die meisten Mütter*]$_i$]
the registration [their-GEN$_i$ children] [by [the most mothers]$_i$]
'the registration of their$_i$ children by [most mothers]$_i$'

For examples such as those in (5), it is widely agreed that the semantic binding relation between the DP containing the quantifier (e.g. *der meisten Kinder* ('of most children') in (5a)) and the pronoun embedded in the adjoined PP (for instance, *ihre Mütter* ('their mothers') in (5a)) should be reflected in a specific structural configuration between the two constituents: The pronoun in the *durch* phrase in (5a) should be c-commanded by the quantifier expression (cf. the seminal work of Reinhart 1983). Thus, according to this line of argument, (5b) is ungrammatical because the quantifier

[8] Although I cannot discuss other binding data for reasons of space, I would like to mention that similar data involving Principle C restrictions may be constructed:

(ii) [$_{DP}$ *die* [$_{NP}$[$_{NP}$[$_{NP}$ *Anmeldung*] [$_{PP}$ *von* [$_{DP}$[*Inas*$_i$] *Sohn*]]] [$_{PP}$ *durch* [$_{DP}$ *sie*$_i$]]]]
'the registration of Ina's$_i$ son by her$_i$'

(iii) *[$_{DP}$ *die* [$_{NP}$[$_{NP}$[$_{NP}$ *Anmeldung*] [$_{PP}$ *von* [$_{DP}$ *ihrem*$_i$ *Sohn*]]] [$_{PP}$ *durch* [$_{DP}$[*Inas*]$_i$ *Kollegin*]]]]
'the registration of her$_i$ son by Ina's$_i$ colleague'

does not c-command the pronoun. One possible formulation of c-command is given below:[9]

> A node α c-commands a node β iff the node which immediately dominates α also dominates β and the following conditions hold: (i) β is not contained in α and (ii) $\alpha \neq \beta$.

If semantic binding is correlated with c-command, the data in (5) require that the genitive phrase containing the quantifier, i.e. the theme argument, should occupy a position structurally higher than that of the agentive *durch* phrase containing the bound pronoun.

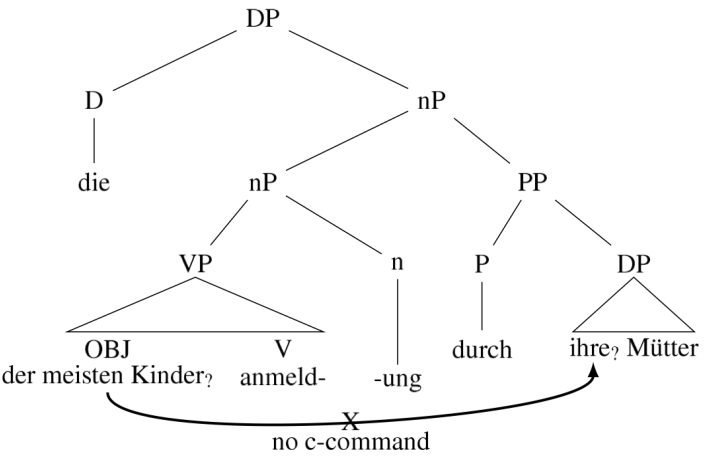


Figure 3. No binding between quantifier and pronoun on DM analysis

However, if we consider the Distributed Morphology structure for (5a) as given in Figure 3, the theme argument genitive is c-commanded by the *durch* phrase, not vice versa, cf. for instance Larson (1988); Jackendoff (1990: 430–436); Pesetsky (1995: 160–167) for discussion of similar configurations. Whether the DP containing the pronoun c-commands the quantifier depends on the status of PPs with regard to c-command, cf. Kuno, Takami, and Wu (2001: 137); Pesetsky (1995: 172–175). If they are considered to be transparent for c-command relations, i.e. if their presence or absence does not make a difference (see below), binding would be possible. Either way,

[9] The additional conditions in (i) and (ii) are not shared by everyone. Thus, Reinhart (1983: 23–25) assumes that a node may c-command itself.

an analysis of the DP in (5a) such as in Figure 3 would seem to either fail in establishing the desired c-command relation or, even worse, wrongly predict that the grammaticality judgements in (5) should be reversed.

Now, to be sure, there are ways in which one could save the above Distributed Morphology analysis assuming structure sharing. One possible solution is to apply Pesetsky's (1995) cascade structures, akin to Larson's (1988) VP shell structures, which Pesetsky assumes to be relevant for c-command structures:

(6) $[_{vP}\ [_{v}$ *anmeld-*$]\ [_{PP}\ [$*der meisten Kinder*$]\ [_{P'}$ *durch* $[_{DP}$ *ihre Mütter*$]]]]$

In (6), the *durch* phrase complement is dominated by V and c-commanded by the genitive DP, whereby the general principle of "rightward is downward" (Pesetsky 1995: 160–162) is fulfilled. However, this structure is not in line with what we know about the behaviour of agentive PPs headed by *von* or *durch* as being adjoined above the vP level (Solstad 2007a). It would also conflict with our semantic assumptions for VoiceP: whereas *durch* in (6) is most plausibly taken to relate two individuals, Voice is normally assumed to involve a semantic relation between an event and individual (Kratzer 1996; von Stechow 1996): λxλe.AGENT(x)(e).

One could also adopt an approach in the spirit of Hoekstra (1999) or Grosz (2008), who analyze nominalized infinitives in Dutch and German, respectively (cf. example (4a)). For instance, Grosz (2008) assumes that the genitive is actually a-moved to a position higher than the subject *durch* phrase, thus creating a new position for the genitive to bind from. This movement operation would then have to be followed by "predicate fronting" (Grosz 2008) of the nominalization, involving the lower nP node in Figure 2.[10] However, although empirically more adequate than an approach along the lines of Pesetsky (1995), the assumptions of movement which this analysis rests on still seem to be rather thinly motivated, cf. the discussion in Grosz (2008) and the references therein.

Next, I show that the above binding data actually provide an argument in favour of my approach, since on an adjunct analysis they can be neatly analyzed without any movement operations while still applying a standard

[10] In his analysis of nominalized infinitives in German, Grosz (2008) assumes an argument position also for subjects, which is compatible with the suggestions of Alexiadou et al. (2009) for such nominalizations, but presumably incompatible with the aforementioned claim of Roßdeutscher and Kamp (2010) that *-ung* nominalizations lack Voice.

definition of c-command for the relation between the genitive DP and the *durch* phrase.

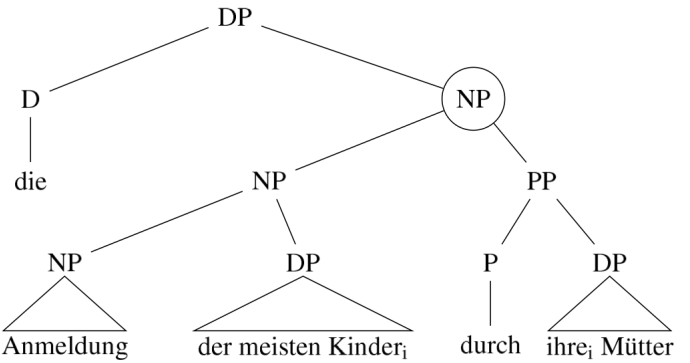


Figure 4. Genitives and PPs adjoining to NP; Structurally lower quantifier binding higher pronoun

In my analysis, the DP in (5a) is assigned a structure as in Figure 4. At first sight, it would seem that also in this tree structure, the genitive DP containing the quantifier would not be able to c-command the pronoun in the *durch* phrase, since the first node dominating the genitive DP does not dominate the PP. Rather, it would seem that it is the PP complement which does c-command the genitive DP under the assumption of PP invisibility to c-command relations. Thus, the exact opposite grammaticality judgements of the generally accepted ones would be predicted, cf. (5). However, as we will see, it is of great importance that we are dealing with an adjunct structure, since in this case there are several conceptions of c-command not identical to the above, standard definition, which allow us to make the correct predictions with respect to the binding data in (5).

Thus, Chomsky (1986: 7), based on work by May (1985: 57), demands for domination in adjunction structures that it should involve categories as opposed to single nodes or segments: For a node α to be dominated by the category β it must be dominated by every segment of β (see also the discussion in Kayne 1994: 15–22).[11] In Figure 4, the category NP consists of the three NP nodes in the adjunction structure. It is only the topmost, encircled NP which dominates the genitive DP. The other NP nodes are merely segments of the category NP. Thus, the relevant node for domination of the

[11] May (1985: 57) uses the term "entire projection" for *category* and "member" or "occurrence" of a projection for *segment*.

genitive DP in Figure 4 is the encircled NP, and not the one directly dominating the DP, as one would assume for non-adjunction structures. Taking the distinction between categories and segments into account, we follow Kayne (1994: 16) in applying a category-based notion of c-command:

> X c-commands Y iff X and Y are categories and X excludes Y and every category that dominates X dominates Y.

According to this definition, the genitive DP ("X" in Kayne's definition) c-commands the PP complement ("Y" in Kayne's defintion), since they are both categories and the only category that dominates them both is the topmost, encircled NP. It may be noted that in effect, this definition comes close to standard formulations of m-command, which refer to maximal projections instead of immediately dominating nodes.

Alternatively, the definition in Reinhart (1983: 23) would also provide the desired c-command relation between the genitive DP and the PP complement:

> Node A c(onstituent)-commands node B iff the branching node α_1 most immediately dominating A either dominates B or is immediately dominated by a node α_2 which dominates B, and α_2 is of the same category type as α_1.

In this case, the encircled NP in Figure 4 corresponds to α_2, whereas the NP immediately dominating the genitive DP corresponds to α_1. Thus, according to the above definition, the genitive DP (node A in Reinhart's definition) c-commands the PP complement (node B in Reinhart's definition).[12]

It should be emphasized that these amendments to the definition of c-command would not make a difference on the Distributed Morphology analysis in Figure 3, since in that structure the genitive DP is dominated by VP, which is of a different category than nP, to which the *durch* phrase is adjoined. If the theme argument is introduced in the root Phrase embedded under the verbal projections, and the argument is not moved out of this position, adjoining the *durch* phrase to VP would not improve the situation either.

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[12] Although I have chosen to exclude PP complements from the discussion, it may be noted that the above analysis can also account for the data in Sternefeld (2007: 587–589), cf. (iv), for which Sternefeld claims that the genitive and the PP cannot both be generated to the right of the head noun *Stolz* (bracketing according to my analysis):

(iv) $[_{DP}\,[_{D}$ *der*$]\,[_{NP}\;\;[_{NP}\,[_{NP}$ *Stolz*$]\,[_{DP}$ *jeden Vaters*$]_i]\,[_{PP}$ *auf seinen*$_i$ *Sohn*$]]]$
$[_{DP}\,[_{D}$ the$]\,[_{NP}\;\;[_{NP}\,[_{NP}$ pride$]\,[_{DP}$ every father$]_i]\,[_{PP}$ on his$_i$ son$]]]$
'[every father's]$_i$ pride for his$_i$ son'

There is one additional issue which has to be solved to the end of claiming that the adjunction analysis can encompass the binding phenomena in (5): According to the definitions of Kayne (1994) and Reinhart (1983), the PP in Figure 4 also c-commands the genitive DP. If the PP is transparent to c-command relations as discussed above, i.e. if it does not constitute a category, the PP complement, which is the DP containing the pronoun, will c-command the genitive DP containing the quantifier. Thus, the above solution seems to buy us the right c-command relation for (5a) at the expense of predicting that the ungrammatical (5b) should also be acceptable. Worse still, if we – in an attempt to exclude (5b) – assume that PPs are actually opaque for c-command relations, i.e. that they do indeed constitute categories in the relevant sense, there is no way we can treat adnominal genitives and *von* phrases on a par. We would predict that the DP in (7) is ungrammatical, contrary to intuitions, since the quantified DP would now be embedded in the opaque *von* PP, resisting the establishment of a proper c-command relation:

(7) *die Anmeldung* [*von* [*den meisten Kindern*]$_i$] [*durch ihre*$_i$ *Mütter*]
the registration [of [the most children]$_i$] [by their$_i$ mothers]
'the registration of [most children]$_i$ by their$_i$ mothers'

As far as I can see, it is possible to save the above c-command analysis by assuming that *von* and *durch* phrases differ with respect to their status as categories in c-command relations. However, this assumption immediately raises the question what would motivate such a differentiation.

In the following, I correlate this variation in transparency with the different nature of the semantics of the two prepositions. I already indicated that *von* is a case marker, freely alternating with genitive case (the freeness of variation being subject to dialectal variation). This being so, it is possible to view *von* as semantically empty and its insertion as a phenomenon solely restricted to the level of Phonetic Form (F. Schäfer, personal communication), in which case it would not be part of any syntactic operations at other stages and thus invisible to the establishment of c-command relations. For *durch* however, the situation is quite different. Since *durch* is able to introduce an agent relation in the absence of Voice (Alexiadou et al. 2009; Solstad 2007a), this preposition must be assumed to make a semantic contribution of its own and thus be present at an earlier stage in syntactic representation: Its semantics is relevant to composition, which is what would justify the assumption that the prepositional phrase constitutes a category in the relevant sense. Consequently, the DP in the complement of *durch* would not c-command the genitive DP under any circumstance as *durch* would be

opaque and a barrier to c-command relations. On the other hand, the presence or absence of *von* would not – due to the fact that *von* phrases do not constitute categories relevant for c-command relations – matter for the possibility of the DP containing a quantifier c-commanding the pronoun in the *durch* phrase complement.

I should hasten to repeat that I do not think that the above binding data should be seen as ultimately decisive, showing that an analysis in the style of Distributed Morphology is bound to fail and that the adjunct approach is the only viable alternative. It is hardly imaginable that there exists any one specific phenomenon over which the matter of what is the internal structure of DPs embedding (de-verbal) nominalizations would be decided. Ultimately, one will have to weigh the evidence in terms of overall architectural issues of the two theoretical approaches, i.e. the lexicalist and non-lexicalist ones. However, I do think that it is fair to conclude that, judging from the above binding data, there is some indication that the adjunction alternative has an advantage above the Distributed Morphology alternative. As a side note, beyond the issue of embedding and c-command, it is also conceivable that an adjunction approach to arguments in nominalizations will allow for a more adequate account of the omissibility of arguments ad-nominally.

It is my goal in the remainder of the paper to show how a semantic analysis could be conceived of that is paired with the surface-oriented structure presented above, in which all post-nominal genitives are assumed to occupy the same syntactic position. Accordingly, the semantics of the genitive has to be one which is characterized either by extensive homonymy or by underspecification to encompass the various interpretations involved. I contend that the latter alternative should be chosen.

3. Semantic construction

In this section, I present a semantic analysis of post-nominal genitives and argument-introducing PPs to be paired with the syntactic analysis presented in the previous section. Let me start by elaborating somewhat on the main claims from Section 1 concerning the semantic analysis: All post-nominal genitives are represented semantically by the underspecified two-place relation ρ (rho). This relation may be differently realized, which is what gives us the various interpretations of post-nominal genitives. It may either be identified with a specific semantic role or some other relation as specified by the noun or nominalization in question, or it may be interpreted as for

instance a possessor. I also show how argument-introducing *von* and *durch* phrases can be integrated into this analysis.

In the following, I study three different DP configurations in detail. For ease of comparison, they all embed NPs headed by the event nominalization *Beschreibung* ('description'), cf. the examples in (8):[13]

(8) a. *die Beschreibung der / von der Bürgermeisterin*
the description the-GEN / of the mayoress
'the description of the mayoress' or 'the mayoress' description'

b. *die Landschaftsbeschreibung der Bürgermeisterin*
the scenery.description the-GEN mayoress
'the description of the scenery by the mayoress'

c. *die Beschreibung durch die Bürgermeisterin*
the description by the mayoress
'the mayoress' description' (agentive only)

In (8a), the genitive *der Bürgermeisterin* ('of the mayoress') as well as the corresponding *von* phrase may be interpreted both as the described object as well as the describing person. They may also marginally receive a non-argument interpretation under the event reading of *Beschreibung* (more on this below, cf. the discussion of example (20)). In (8b), the genitive cannot be interpreted as the theme argument. Instead, the first part of the noun-noun compound, *Landschaft* ('scenery'), specifies the described object, whereas the genitive *der Bürgermeisterin* ('of the mayoress') is most naturally interpreted as the agent of the event of describing. Finally, I discuss cases with a post-nominal *durch* phrase as in (8c), for which only one interpretation is available, namely that the mayoress is the agent of the describing event.[14]

The semantic analysis is framed in Underspecified Discourse Representation Theory (UDRT; Reyle 1993), applying the DRT formalization out-

[13] *Beschreibung* has at least two more "object" readings: First, it may refer to the informational content of description. Second, it may also receive an interpretation which may be paraphrased as 'object carrying information which serves as a description' (e.g. a piece of paper containing a description). (8a) and (8b) are ambiguous between event and object readings, but in the following I only focus on the event reading of *Beschreibung*. See Roßdeutscher and Kamp (2010) for relevant discussion.

[14] Recall that adnominal *durch* phrases have other, unrelated interpretations which I do not discuss here, cf. Solstad (2007a).

lined in Kamp (2001). The formalization is first and foremost intended to be paired with the specific syntactic analysis presented in this paper.

Although I argue against a syntactic analysis of structure sharing between VPs and DPs as it is assumed in Distributed Morphology, I follow the semantic analysis for *-ung* nominalizations in Roßdeutscher and Kamp (2010), which leans heavily on Distributed Morphology with respect to the morphology of *-ung* nominalizations. Mostly, I ignore any issues concerning word formation (see Roßdeutscher and Kamp 2010), and many of the details concerning the exact semantic representation of *-ung* nominalizations are left out. I treat the semantic representation for *Beschreibung* as being provided by a lexical component to be inserted at an N head node. Contrary to the Distributed Morphology approach, I do not assume that the word-internal structure is part of (clausal) syntax proper in any sense (for discussion see Roßdeutscher and Kamp 2010).

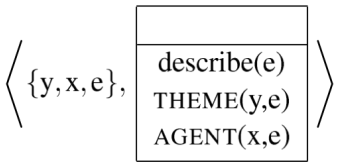
It should be added that attempts at a uniform semantic analysis of the different kinds of genitives have been undertaken before (see for instance Asher and Denis 2004; Vikner and Jensen 2002). Vikner and Jensen (2002) rely on the semantics of the NP which is modified by the genitive to contain the semantic relation to which the genitive relates, or alternatively to be coerced into including it. To predict the various interpretations, they apply the qualia structures of Pustejovsky (1995). Thus, they assume that all nouns are relational or potentially relational in a wider sense. Asher and Denis (2004) introduce an elaborate typing system to avoid some problems concerning the qualia-based approach of Vikner and Jensen (2002). Partee and Borschev (2003) discuss – and refute – uniform analyses of adnominal genitives (among them the one of Vikner and Jensen 2002), leaving it open whether the availability of a uniform analysis could be dependent on the language of study. Partly for reasons of space, I only comment occasionally on these analyses in what follows. My aim in this paper is to show how the uniform syntactic analysis above may be paired with an equally underspecified semantics and that a uniform analysis is indeed plausible, at least for German. What sets my analysis apart from the approaches just mentioned is that I (i) specify a surface-oriented syntactic adjunct construction for the phenomena under discussion, (ii) frame my semantic analysis in UDRT, and (iii) include PPs corresponding to external arguments.

The construction principles for the Discourse Representation Structures cannot be discussed in great detail, but hopefully precisely enough to allow the reader to grasp the main ideas of the framework. A bottom-up compositional approach is pursued (cf. e.g. Kamp 2001; Sæbø 2008; Solstad 2007b). The reader is referred to Kamp (2001: 221–231) for further details concern-

ing the formalization. I introduce necessary machinery as I discuss the relevant aspects of the semantic interpretation of the DPs in (8).

The semantic representations for *beschreiben* and *Beschreibung* are basically assumed to be identical, cf. the simplified DRS in (9):[15]

(9)



The representation in (9) is in the general format of a *semantic node representation*. Such representations are made up of a pair of a *content* and a *store* element. The store occupies the left hand side of the representation in (9), consisting of the set of variables y, x, and e in this case. Generally, the store is a set of one or more triples of a variable, a constraint (also a DRS) and a binding condition. Binding conditions provide information on the possible binding relations a variable may enter, and constraints add to this by specifying the semantic content of the variable, such as gender features necessary for the correct binding of pronouns. For the sake of readability, I mostly only display the variables in the present analysis. The motivation for dividing a semantic representation in a store and a content part, as opposed to just having a main DRS, is that many of the variables which are introduced in (bottom-up) composition cannot be bound right away. A store mechanism is needed to handle these variables properly. In DRT, such a mechanism was first introduced by van der Sandt (1992) in his treatment of presupposition verification and accommodation.

The content part consists of the DRS on the right hand side of the representation in (9). It includes semantic information on the participants of the event, i.e. on the semantic roles involved in events denoted by *beschreiben* and *Beschreibung*. It may be noted that in this case, verb and nominalization share the same set of semantic roles.

Composition is assumed to proceed by way of unification. Thus, semantic node representations, i.e. content-store-pairs attached to different tree

[15] For instance, the representation in (9) is simplified in the sense that it makes no reference to the different semantic components of *be-schreib-en* or *Be-schreib-ung* as they are derived from the stem *schreib*. I also leave out the representation of both definiteness and the temporal anchoring of nouns (Kamp 2001; Tonhauser 2002).

nodes, are unified when they are merged (cf. Bende-Farkas and Kamp 2001). Store variables are unified according to their binding conditions, upon which the content DRSs are merged. I return to this point below, but first I would like to make some remarks on the relation between verbal projections and their corresponding nominal constructions in my approach.

The verb *beschreiben* and the nominalization *Beschreibung* have identical stores, cf. (9). In other words, no variable binding is involved in the nominalization of the predicate. The variables y, x, and e thus need to be bound at the level of NP or later. With regard to this, there is one crucial point where I differ from Distributed Morphology analyses such as the one of Roßdeutscher and Kamp (2010): Whereas theme arguments are introduced as adjuncts to the NP node in my analysis, Roßdeutscher and Kamp (2010) assume that theme arguments are realized where they are introduced semantically, namely in the extended verbal projection. As a result, the theme argument variable y is already bound when nominalization occurs on their analysis.

As already mentioned, the semantic representation of the predicate is not altered after the application of the *-ung* suffix. However, the application of *-ung* makes the modification by the ρ relation possible, the latter of which is introduced by the genitive: It is assumed that the semantics of any noun may be modified by ρ. This is clearly a hypothesis which has to be qualified further, but here I will only remark that this assumption mirrors the empirical fact that any noun may have a genitive attached to it.

The semantics of the relation ρ is specified in (10):

(10) $\left\langle \{u, \rho, z\}, \boxed{\begin{array}{|c|}\hline \\ \hline \rho(u,z) \\ \hline \end{array}} \right\rangle$

The variables u and z are sortally underspecified. While u is bound by the head noun of the genitive phrase, z is unified with the referential argument of the noun to which the genitive phrase is adjoined. ρ may be seen as presuppositional and thus subject to other binding mechanisms than those of u and z, but for the sake of simplicity, I handle the three variables equally.

First, I discuss genitives and *von* phrases. As stated earlier, I assume that these are semantically equivalent. Hence, although I mostly use genitives in the examples below, my comments apply to *von* phrases as well. In the first example, (8a), repeated below for convenience, the genitive *der Bürgermeisterin* ('of the mayoress') may be interpreted both as the theme, i.e. the described object, as well as the agent, i.e. the describing person:

(8a) *die Beschreibung der / von der Bürgermeisterin*
the description the-GEN / of the mayoress
'the description of the mayoress' or 'the mayoress' description'

The representation of the genitive DP *der Bürgermeisterin* emerges as follows:[16]

(11) $\left\langle \{\rho, z\}, \boxed{\begin{array}{|c|}\hline w \\ \hline \rho(w,z) \\ \text{mayoress}(w) \\ \hline \end{array}} \right\rangle$

In (11), the variable u is bound by w which is introduced by the noun phrase *d- Bürgermeisterin* ('the mayoress'), the latter thus providing a specification of the variable u.

In the next step, the representation of the NP *Beschreibung* and the representation of the DP genitive *der Bürgermeisterin* ('of the mayoress') are unified, since they are sister nodes, cf. the general structure in Figure 1 (⊎ is the unification operator):

(12) $\left\langle \{y, x, e\}, \boxed{\begin{array}{|c|}\hline \\ \hline \text{describe}(e) \\ \text{THEME}(y,e) \\ \text{AGENT}(x,e) \\ \hline \end{array}} \right\rangle \uplus \left\langle \{\rho, z\}, \boxed{\begin{array}{|c|}\hline w \\ \hline \rho(w,z) \\ \text{mayoress}(w) \\ \hline \end{array}} \right\rangle$

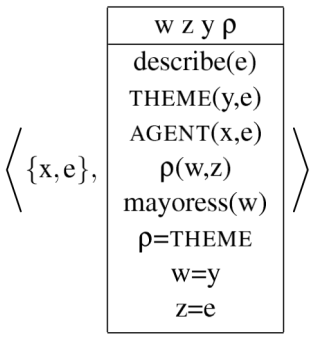
What we need to accomplish in the case of the noun *Bürgermeisterin* contained in a genitive or a *von* phrase to be interpreted as an argument of the nominalization, is first of all an identification of the relations AGENT or THEME with ρ. Second, depending on the relation with which ρ has been identified, w binds y in the case of a theme interpretation and x in case of an agent interpretation. Finally, z is identified with e, the referential argument of the nominalization. It should be noted that the exact ordering of the unification steps is not crucial (see the discussion of binding possibilities below).

The result of unification in the case of the theme interpretation of the genitive is given in (13). The equations at the bottom of the DRS box specify which discourse referents are unified:

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[16] The representation in (11) is simplified in the sense that I have eliminated a step showing the identification of u with w to enhance readability in later representations.

(13)



In (13), ρ has been identified with THEME, w with y and z with e. The variables e and x are still unbound. In the absence of an agent, for instance in the form of a *durch* phrase, the variable x will have to be bound existentially or identified in context. Following Roßdeutscher and Kamp (2010), I assume that the referential argument e of the nominalization is bound at the level of DP, a step which is not shown in this paper.

The agent reading of the genitive only differs from the above analysis insofar as now ρ is identified with the AGENT relation and, consequently, the variable x in the AGENT relation is bound by w of the ρ relation. In this case, unification of the representations of the *-ung* nominalization and that of the genitive DP leave the variable y of the THEME relation unbound.

What has been said so far could be taken to indicate that in the case of nominalizations such as *Beschreibung*, which involve two argument relations, a post-nominal genitive is equally likely to receive a theme or an agent interpretation. However, this is not quite in line with intuitions reported by many native speakers (although some disagreement exists): There seems to be a slight preference for the theme interpretation of post-nominal genitives with many de-verbal nominalizations.[17] In order to account for

[17] Below, I discuss noun-noun compounds headed by *Beschreibung* in which the genitive cannot be interpreted as the theme argument. It may be noted that Ehrich and Rapp (2000: 274 ff.) put forward the claim that for *-ung* nominalizations based on change-of-state predicates such as *Absetzung* ('unseating'), a post-nominal genitive may only be interpreted as the theme argument, cf. (v). From the point of view of my analysis, such an observation would be wholly unexpected. However, the restriction discussed by Ehrich and Rapp (2000) apparently does not involve a hard constraint, cf. (vi), where the post-nominal genitive may indeed be interpreted as the agent of the unseating:

(v) *die Absetzung des Bundestages*
the unseating the-GEN Bundestag
'the unseating of the Bundestag' …

such a preference, I have to assume that the variables in the store are ordered or sorted in a way which leads to preferences with respect to binding possibilities. This would be a reflection of bottom-up composition as it is assumed for verbal projections, where the internal argument is bound before the external one.

Additionally, I assume a general principle for interpretation to achieve the correct binding relations: Variables should preferably enter local binding relations as opposed to being bound merely existentially or identified in context, a principle which may be summarized as follows:[18]

Do not overlook binding possibilities.

The preference for an object reading of a genitive should follow from the ordering of the variables, whereas the principle *Do not overlook binding possibilities* makes sure that non-argument readings of a genitive, i.e. where the genitive is interpreted neither as the agent nor as the theme argument, although it would be possible, need special contextual motivation, cf. the discussion of possessive and associative readings below. If the ρ relation of the genitive or *von* phrase is not identified with the THEME or AGENT relation and consequently neither variable y nor variable x are identified with w of the ρ relation, binding possibilities have been overlooked. What is more, the semantic relation introduced by the genitive has to be accommodated as representing some relation different from the THEME or AGENT one, which should also be more costly. This view would fit well with an analysis of the ρ relation as being presuppositional in nature, as similar processes may be observed there, cf. van der Sandt's (1992) preference for presupposition verification over accommodation. However, I have to leave further exploration of these mechanisms to future research.

For reasons of space, I cannot discuss the case of genitives adjoined to NPs headed by relational nouns in any detail, but I would like to show that they may be analyzed in the same fashion as the above nominalizations. Consider example (14):

(vi) *die Kanzlerabsetzung des Bundestages*
the chancellor.unseating the-GEN Bundestag
'the Bundestag's unseating of the chancellor'

[18] It may be noted that this principle is related to the DOAP principle of Williams (1997: 603): "Do not overlook anaphoric possibilities".

(14) *der Vater des Studenten*
the father the-GEN student
'the father of the student'

The representation of *Vater des Studenten* (with the genitive adjoined to the NP *Vater*) before unification is given in (15), where the representation of *Vater* ('father') occurs to the left of the unification operator ⊎ and the representation of the genitive *des Studenten* ('of the student') to its right.

(15) $\left\langle \{y,x\}, \begin{array}{|c|}\hline \\ \hline \text{father(x,y)} \\ \hline \end{array} \right\rangle \uplus \left\langle \{\rho,z\}, \begin{array}{|c|}\hline \text{w} \\ \hline \rho\text{(w,z)} \\ \text{student(w)} \\ \hline \end{array} \right\rangle$

In (15), identifying a relation for ρ to be unified with is straightforward. There is only one two-place relation with which the ρ relation introduced by the genitive could be identified, as opposed to the case of the nominalization above which involved two such argument relations. Following the analysis of relational nouns in Barker (1995: 50–52), y would be the referential argument of such nouns, thus being the variable that z must be identified with. After unification, the following representation emerges. It should be compared to (13) above:

(16) $\left\langle \{y\}, \begin{array}{|c|}\hline \text{w x z } \rho \\ \hline \text{father(x,y)} \\ \text{student(w)} \\ \rho\text{(w,z)} \\ \rho\text{=father} \\ \text{w=x} \\ \text{z=y} \\ \hline \end{array} \right\rangle$

While the variable x is bound by w, y is not bound before the level of DP, as are all referential arguments of noun phrases (see above).

Turning now to a case where an identification of the ρ relation with that of the theme argument is excluded, I discuss an example in which the *-ung* noun is the head of a noun-noun compound (Fabricius-Hansen 1993), cf. example (8b), repeated below for convenience:

(8b) *die Landschaftsbeschreibung der Bürgermeisterin*
the scenery.description the-GEN mayoress
'the description of the scenery by the mayoress'

In (8b), it is not possible to interpret the DP as denoting an event in which someone describes the mayoress. It might thus seem reasonable to assume that the first part of the compound, *Landschaft* ('landscape') binds the variable y, making it inaccessible for entering a binding relation with w which is introduced by the genitive *der Bürgermeisterin*. Such a view is defended by Grimshaw (1990: 14–19; 68–70) who hypothesizes that the first part of the compound is theta-marked by the head of the compound. More recently, Lieber (2004: 54–59) has described the relation between the first part of the compound and its head as one of *co-indexation*, which is in effect a mechanism of argument saturation. However, it is not difficult to find examples which show that these approaches make the wrong predictions. There are cases where both the first part of the noun-noun compound and the post-nominal genitive seem to specify the variable y:

(17) a. *die Personenbeschreibung der Täter*
the person.description the-GEN delinquents
'the personal description of the delinquents'

b. *die Strukturbeschreibung des einfachen Arraymodells*
the structure.description the-GEN simple array model
'the structural description of the simple array model

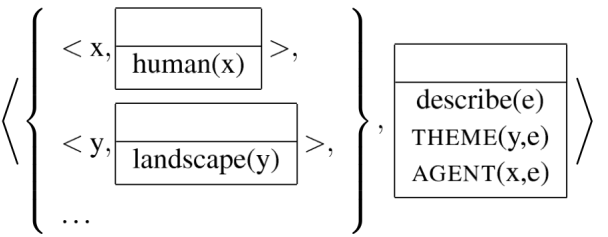
As in the case of (8b), the first part of the compound in (17a), *Personen* ('personal'), merely specifies the particular sort of *description* we are dealing with. Thus, *Personen* restricts the possible theme arguments of *Beschreibung*. Similar remarks apply to (17b).

I cannot go into great detail concerning noun-noun compounds, for which also incorporation should be discussed. However, in light of the above data, we may conclude that no binding occurs between the theme argument variable y and the first part of the compound. Otherwise, the genitive could not be interpreted as the theme argument in (17a). If the first part of the compound binds the theme argument variable and thus saturates the theme argument role, this argument is no longer available for binding by w which is introduced by the genitive. What rather seems to be the case is that the first part of the compound introduces further selectional or sortal constraints on the binding possibilities of variable y.

As briefly mentioned in the discussion of the representation in (9), such constraints are included in the store part of the representation. The store parts displayed until now only included the variables themselves with no further information on the possible binding relations they could enter. Thus, in order to show how these constraints contribute to the determination of

the possible binding relations between the discourse referents introduced by the genitive and those of a noun-noun compound, it is necessary to expand the representations applied so far. Below, I provide the relevant parts of the extended representations for *Landschaftsbeschreibung* ('description of the scenery') and the genitive *der Bürgermeisterin* ('of the mayoress'). However, for reasons of space I do not show explicitly how these representations are unified. The representation of *Landschaftsbeschreibung* is shown in (18):

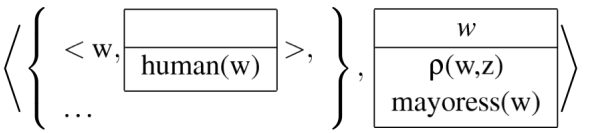
(18)



The store in (18), which only shows the elements relevant to the current discussion, contains two store elements, each consisting of a variable and a constraint in the form of a DRS.[19] The crucial part of the representation are the two DRS constraints, which in the case of noun phrases may for instance provide sortal information, or features of grammatical gender that may be decisive for the establishment of proper binding relations. When variables enter binding relations, their constraints must be obeyed. Thus, the representation in (18) tells us that the agent (x) must be sortally restricted to humans, whereas the theme (y) is restricted to belonging to the ontological category of landscapes. Any discourse referent entering a binding relation with x or y must have features which are compatible with these constraints.

Turning next to the more elaborate store representation for the genitive *der Bürgermeisterin* in (19), we see that the constraint on w is identical to that of variable x, compare (18) above:

(19)



[19] As mentioned above, store elements are actually assumed to be triples, the last element in the tuple being a binding condition, which e.g. is different for indefinites and definites. In this paper, I ignore binding conditions since they are not directly relevant to the present discussion.

Assuming that the constraints human(w) and landscape(y) are ontologically incompatible, the only binding relation which may be established when the representations in (18) and (19) are unified, is the one between w and the agent variable x.

It was already mentioned that genitives in German may also be assigned other interpretations than agent and theme ones. This is possible also in the case of *Landschaftsbeschreibung der Bürgermeisterin* in (8b), which may refer to a description of a scenery that we somehow associate with the mayoress, as for instance in a case where it is the description of a scenery which was told to the mayoress. This reading is very marginal though, which could be led back to the fact that such a reading would violate the principle *Do not overlook binding possibilities*, since this reading can only be invoked if the genitive ρ relation is not identified with the AGENT relation of the head *Beschreibung*. Another example, where the non-argument reading is more obvious, is given in (20):[20]

(20) *Die Volksabstimmung der Hanf-Initiative steht kurz bevor.*
the popular vote the-GEN hemp initiative stands short before
'The popular vote initiated by the hemp initiative is imminent.'

In (20), the genitive *der Hanf-Initiative* ('of the hemp initiative's') cannot be interpreted as the agent of voting, nor as the matter over which the votes should be cast. Rather, it is most natural to interpret the genitive as denoting the set of individuals who called for the popular vote in the first place.

In these cases of non-argument interpretation of a genitive, there is an important difference to the above binding of ρ: How is the ρ relation specified as some other associative relation if there is no such relation contained in the representation of the NP?

Admittedly, relations such as possession and association are both rather vague. It should be clear that we need to restrict the ρ relation in general. I have no good answer to the question of how the specification and restriction of ρ should be conceived of. For two opposing suggestions, the reader is referred to the aforementioned alternatives Vikner and Jensen (2002) and Asher and Denis (2004), who exploit qualia structures and complex types, respectively. Nevertheless, I would like to make one informal suggestion

[20] The authentic sentence continues as follows: "… am 30.11.2008 werden die Schweizer abstimmen, ob Cannabiskonsumenten in ihrem Land weiterhin gegen das Gesetz verstossen werden", which may be translated as "… on November 30th, 2008, the Swiss will vote on whether Cannabis consumers will be violating the law in the future as well."

concerning the emergence of the possessive interpretation (see also Barker 1995: 73–75). It may be assumed that a possessive reading may be instantiated whenever the referential argument z of the noun is an object and the semantic entity which enters a binding relation with y denotes a person. A person and an object may enter a possessive relation, whereas individuals and events do not enter possessive relations.

An additional point to be made is that if the ρ relation, as suggested above, is analyzed as being presuppositional in nature, it would be possible to see the process of its specification as one of presupposition accommodation in the cases of associative or possessive readings. Again, the issue of constraining the interpretational variance is of great importance, since accommodation is such a powerful mechanism. Unfortunately, I cannot discuss this matter any further in this paper.

Next, let us see how the unambiguous case of agentive *durch* phrase modification is analyzed, cf. (8c), repeated below for convenience:

(8c) *die Beschreibung durch die Bürgermeisterin*
the description by the mayoress
'the mayoress' description' (agentive only)

Since *durch* is the default preposition introducing external arguments in nominalizations, I propose to represent its semantics as follows:

(21) $\left\langle \{v, e'\}, \boxed{\begin{array}{|c|}\hline \\ \hline \text{AGENT(v,e')} \\ \hline \end{array}} \right\rangle$

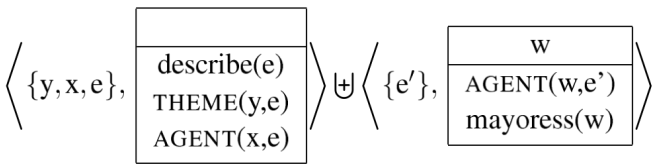
We actually need a more general reference to an external argument role since the external arguments introduced by a *durch* phrase may be for instance both agents and experiencers. However, the AGENT role is sufficient for my current needs.[21] The representation of the *durch* phrase emerges as follows:

(22) $\left\langle \{e'\}, \boxed{\begin{array}{|c|}\hline w \\ \hline \text{AGENT(w,e')} \\ \text{mayoress(w)} \\ \hline \end{array}} \right\rangle$

[21] There is an interesting difference in distribution between *von* and *durch* in verbal passives and nominalizations with respect to agentivity. Whereas *durch* is the preferred agentive preposition in nominalizations, *von* is clearly the preferred preposition for introducing agents in verbal passives. In these constructions, the agentive use of *durch* is strongly restricted. Unfortunately, I cannot treat this variation in any detail here, cf. the discussion in Solstad (2007a: 299–307).

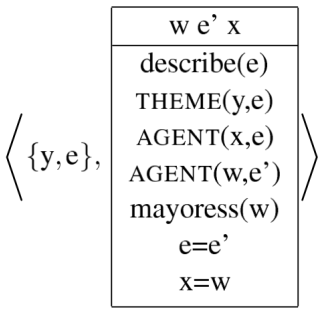
Again, the representation of the adjunct is unified with the representation of the *-ung* nominalization. (23) shows the semantic representation prior to unification at the NP node to which the PP is adjoined:

(23)



The AGENT relation of the *durch* phrase may, as opposed to the ρ relation associated with genitives and *von* PPs, only be identified with the agent relation of the predicate *beschreiben*, since the THEME and AGENT relations are semantically incompatible with regard to unification. Thus, the only alternative is to identify the AGENT relation of the *durch* phrase with the AGENT relation of the nominalization. Consequently, x and w as well as the two event variables e and e' are identified. Variable y has to be existentially bound or identified in context, while e is bound at DP level, being the referential argument of the DP. The representation in (24) shows the result of unification:

(24)



Rounding off this section on the semantic analysis, I would like to comment on constructions where a genitive and a *durch* phrase both modify the *-ung* nominalization. In this case, there is only one syntactic order which is acceptable, since a genitive may only semantically modify a noun to which it is also adjacent.[22]

[22] The DP in (25b) is not ungrammatical as such, but it may only, somewhat obscurely, denote descriptions of some unspecified entity by someone who is the mayoress of the landscape, and not descriptions of the landscape.

(25) a. *die Beschreibung der Landschaft durch die Bürgermeisterin*
the description the-GEN scenery by the mayoress
'the description of the scenery by the mayoress'

b. #*die Beschreibung durch die Bürgermeisterin der Landschaft*
the description by the mayoress the-GEN scenery
'The description by the scenery's mayoress'

As already noted, a syntactic adjacency constraint on the occurrence of the genitives is needed to be able to achieve the correct syntactic distribution in these cases (see the discussion of example (3)). The semantic part of the analysis consists of a combination of the two composition procedures presented above. First, the genitive is unified with the representation of the NP *Beschreibung* as illustrated in (13), binding the THEME variable y (with the exception that in that particular case, the genitive DP was *der Bürgermeisterin*), upon which the *durch* phrase is unified with the result of this unification as in (24), binding the variable x, which is unbound when only a theme argument is present, cf. the representation in (13).

4. Conclusion

I have shown that a uniform syntactic and semantic analysis of post-nominal genitives and argument-introducing PPs in German is tenable. More precisely, I have made the following claims:

- All post-nominal genitives and argument-introducing PPs headed by *von* and *durch* are NP adjuncts.
- All post-nominal genitives are related to the head noun via an underspecified semantic relation ρ denoted by the genitive. This relation may be specified as the argument of the (relational) noun or nominalization in question or otherwise be interpreted as more vaguely associated with the NP. The same picture emerges for *von* phrases, whereas *durch* phrases are specified as being agentive in every case.

Referring to evidence involving binding phenomena, I argued against assuming structure-sharing between VPs and their corresponding nominalizations, contrary to current analyses in frameworks such as Distributed Morphology (cf. e.g. Roßdeutscher and Kamp 2010). Related to this, there are two further observations concerning the syntax-semantics interface that can be made in light of the current analysis: Firstly, as long as there is no clear

syntactic evidence that post-nominal genitives and PPs should be differentiated syntactically, we should not necessarily let semantic considerations alone, i.e. argument-modifier distinctions, lead us to the postulation of structural differences. Secondly, it may be emphasized that the question of which node a semantic relation should be specified for, i.e. a head or its modifier, is not in every case a question of either-or. Applying unification, such relations may be included in both head and modifier.

The analysis may be viewed as a combination of the split and uniform approaches discussed by Partee and Borschev (2003): All genitives – argument and non-argument ones – are represented the same way and composed with the head noun in a uniform way. However, due to the application of unification as a mode of composition, we are not required to treat the genitives uniformly either as arguments or as mere modifiers of the head noun. De-verbal nominalizations and relational nouns introduce an argument relation with which the ρ relation is identified. In combination with nouns which do not include an argument relation, accommodation of the ρ relation is enforced, the result of which is dependent on both the semantics of the head noun and that of the genitive DP.

Leaving a number of issues for future research, such as for instance the extension of the analysis to pre-nominal genitives and possessive pronouns on the one hand and the application to further languages on the other, I still hope to have shown that the above approach merits further exploration.

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Author index

Abney, Steven, 2, 99, 159
Ackema, Peter, 21
Adger, David, 137, 150
Alexiadou, Artemis, 1–4, 9, 12, 14, 16, 21, 24, 39, 41, 44, 48, 52, 58, 60, 67–68, 88, 93, 129, 132, 138, 150, 154, 159, 161, 165, 167, 172, 179, 181–182, 184–185, 193, 199, 201, 204–206, 209–212, 214, 220, 222, 225–226, 229, 232, 248
Anagnostopoulou, Elena, 167, 172, 184, 222
Anderson, Mona, 181
Arad, Maya, 13, 34
Asher, Nicholas, 235, 244, 248

Babko-Malaya, Olga, 111–112
Baker, Mark C., 24, 100
Bally, Charles, 131, 134, 140
Barker, Chris, 13, 220, 241, 245
Bašić, Monika, 3, 6, 39, 88, 176, 199, 213
Bende-Farkas, Àgnes, 237
Berlan, Françoise, 30
Bhatt, Rajesh, 152, 153
Bierwisch, Manfred, 201, 214
Boleda, Gemma, 131, 135–136
Bolinger, Dwight, 134
Booij, Gert, 26–27, 31, 33, 82
Bordelois, Yvonne, 85
Borer, Hagit, 2, 12, 14, 23–24, 39, 44, 84, 106, 120, 122, 129, 132, 149–150, 154, 160, 181–183, 193, 206, 209, 224
Borschev, Vladimir, 220–221, 226, 235, 248
Bowers, John, 137
Brito, Ana Maria, 6, 199–204, 209–215

Caha, Pavel, 55, 79
Chomsky, Noam, 3, 81, 120, 129, 163, 209, 230
Cinque, Guglielmo., 18, 99–100, 104, 116, 123, 138
Collins, Chris, 159
Cuervo, Maria Cristina, 185

de Hoop, Helen, 23
Dell, François, 130
Demonte, Violeta, 136, 138
Den Dikken, Marcel, 159, 181, 193
Denis, Pascal, 235, 244
Doron, Edit, 172, 174, 181–182, 185–186, 193
Dowty, David R., 159, 185, 187

Ehrich, Veronika, 222, 239
Embick, David, 27, 49, 52

Fabb, Nigel A. J., 9
Fábregas, Antonio, 4, 6, 67, 83, 88, 131, 134, 140, 155
Fabricius-Hansen, Cathrine, 241, 248
Ferrari, Franca, 16, 22, 93, 104
Filip, Hana, 109, 114
Folli, Raffaella, 160
Forza, Francesca, 83
Fox, Danny, 183–184, 185
Fradin, Bernard, 130–131
Frank, Anette, 223
Fu, Jingqi, 181, 224

Gärtner, Hans-Martin, 79, 81–82
Georgiev, Stanjo, 94, 98, 101
Giusti, Giuliana, 99
Godard, Daniéle, 226–227
Goldberg, Adele, 22–23
Gradinarova, Alla A., 95

Grimshaw, Jane, 1–2, 14, 23, 39, 41–44, 57, 59–60, 64, 67, 93, 107, 109, 129, 132, 145, 152, 181–182, 185, 199–204, 209, 211, 242
Grodzinsky, Yosef, 183–185
Grosz, Patrick, 229

Hale, Kenneth, 206
Halle, Morris, 67, 132
Hamm, Fritz, 248
Harley, Heidi, 2, 12, 15, 24, 41, 52–53, 57–58, 67, 88, 160–161, 163–167, 171–173, 179, 188, 191, 209
Hartmann, Katharina, 220, 222
Hay, Jennifer, 68
Hazout, Ilan, 181, 183
Heyvaert, Liesbet, 26
Hoekstra, Teun, 191, 229
van Hout, Angeliek, 9, 12, 15, 16, 24, 32, 104

Irwin, Patricia, 34
Istratkova, Vyara, 105, 115–116

Jackendoff, Ray, 228
Jensen, Per Anker, 235, 244

Kamp, Hans, 11, 132–133, 222, 225, 229, 234–237, 239, 247–248
Karagjosova, Elena, 248
Kayne, Richard S., 159, 230–232
Kerleroux, Françoise, 130–131
Keyser, Samuel J., 9, 206
Kolliakou, Dimitra, 226
Kratzer, Angelika, 15, 47, 159, 185, 190, 211, 229
Krifka, Manfred, 69
Kuno, Susumu, 228

Landau, Idan, 185
Langacker, Ronald W.
Larson, Richard, K., 16, 133–134, 139, 159, 199, 227–229
Lekakou, Marika, 21
Levin, Beth, 9–11, 16, 20–22, 26, 160, 163, 165, 177, 182, 189–193, 205–206
Lieber, Rochelle, 26–27, 31, 33, 82, 242
Longobardi, Guiseppe, 10, 185

Marantz, Alec, 12–13, 28, 78, 129, 132, 161, 163, 212
Marchis, Mihaela, 18, 30
Markova, Angelina, 4, 93, 98, 120
Martin, Fabienne, 30, 68, 81
May, Robert, 17, 145, 230
McNally, Louise, 131, 135–136
Mittwoch, Anita, 14, 21–23
Moltmann, Friedericke, 152

Neeleman, Ad, 79
Noyer, Rolf, 160–161, 163–167, 171, 173, 188, 191, 209
Ntelitheos, Dimitrios, 16, 22, 24–25

Oliveira, Fatima, 202–204, 209–210, 214

Padrosa-Trias, Susanna, 120
Pancheva, Roumyana, 152–153
Parsons, Terence, 177
Partee, Barbara H., 132–133, 135, 220–221, 226, 235, 248
Pashov, Petŭr, 94, 96–97, 102
Pesetsky, David, 161–163, 172, 188, 227–229
Picallo, M. Carme, 86, 125, 129, 201, 204, 209, 211
Plag, Ingo, 68
Pustejovsky, James, 235
Pyllkänen, Liina, 185
Ramchand, Gillian, 6, 54–55, 68–70, 79, 88, 137, 150, 160, 199, 206–209, 211–213, 215
Rapoport, Tova, 160, 182, 185
Rapp, Irene, 222, 239
Rappaport Hovav, Malka, 9–11, 16, 20, 26, 189–190, 206
Rathert, Monika, 1, 248
Reichenbach, Hans, 101

Reinhart, Tanya, 165, 207, 227–228, 231, 232
Reyle, Uwe, 234, 248
Riester, Arndt, 248
Roeper, Thomas, 9, 12, 15–16, 24, 32, 104, 181, 185, 209, 212, 224
Roßdeutscher, Antje, 11, 18, 222, 225, 229, 234–235, 237, 239, 247–248
Roy, Isabelle, 4–5, 88, 129
Ryder, Mary E., 25, 27, 31–32

Sæbø, Kjell Johan, 235
Safir, Ken, 181
Salanova, Andrés, 17
Scalise, Sergio, 67, 83
Schäfer, Florian, 3, 9, 12, 14, 16, 21, 24, 26–27, 161, 165, 167, 172, 184, 193, 222, 225, 232, 248
Schoorlemmer, Maaike, 21, 42–45, 60
Sichel, Ivy, 5, 159, 183, 185
Siegel, Muffy, 133, 138
Sleeman, Petra, 6, 199, 201, 209–215
Snyder, William, 193
Solstad, Torgrim, 6, 219, 222, 226, 229, 232, 234–235, 245
Stancheva, Ruska, 102
Starke, Michal, 55, 81
von Stechow, Arnim, 226, 229
Sternefeld, Wolfgang, 222, 225, 231
Svenonius, Peter, 50, 62, 88, 101, 105, 111–112, 114, 121, 137–138, 155, 159–160
Sybesma, Rint, 181
Széndroi, Krista, 79

Takami, Ken-ichi, 228
Tenny, Carol, 69, 182
Thráinsson, Höskuldur, 159
Tonhauser, Judith, 236
Truswell, Robert, 138

van der Sandt, Rob A., 236, 240
Van Valin, Robert, D., 166
Varela, Soledad, 88
Verkuyl, Henk, 69
Vikner, Carl, 235, 244

Wechsler, Stephen, 198
Wilder, Chris, 138
Wilkins, David, P., 166
Williams, Edwin, 14, 240
Wolff, Phillip, 164, 177
Wu, Yuru, 228

Zaenen, Annie, 172
Zimmermann, Malte, 220, 222

Subject index

affectedness, 181–182, 186
affix rivalry, 3–4, 67–68, 73
agency/agentivity, 5, 48–49, 52, 56–57, 161, 165–167, 171, 178, 183, 185, 192, 210–211, 245
argument, 1–3, 5–6, 9–10, 13–16, 20–23, 25–27, 29, 32–34, 39, 41–42, 47, 53, 57–61, 63–64, 68, 70–72, 74–88, 93, 101–102, 104, 106–112, 116, 120–122, 124–125, 129, 132, 137, 145–146, 148–155, 159–161, 163, 166, 171, 178–179, 181–183, 185–187, 189–190, 193, 199–201, 203–204, 206, 208–210, 213, 220, 223, 226–229, 231, 234, 237–242, 247, 248
argument/complement structure (AS/CS), 1–6, 9, 10–30, 32–34, 39–43, 45–50, 52–64, 67–88, 93, 95–102, 104–122, 125, 129–142, 144–156, 159–161, 163–168, 170–179, 181–193, 199–214, 219–248
  ~ nouns, 109–111, 122
aspectual features, 116
aspectual prefixation, 117
Augmented events, 161

bare resultatives, 177–178, 190
binding, *see also* c-command, 12, 226–233, 236–238, 240, 242–245, 247
  ~ of discourse referents, 243
  semantic ~, 227–228

CAUSE, 162, 164–165, 167, 170–174, 177–178, 183–184, 188–189
c-command, *see also* semantic binding, 27, 224, 228–233
  category-based ~, 231
  transparency ~, 232
Complex Event nominals, 39–42, 48, 55, 57–59, 64, 107, 109, 145, 148, 150, 154, 188, 190, 213
compound, 20, 83, 242
  noun-noun ~, 239, 241–243
context, 11, 13, 21–23, 27, 30, 32–34, 82, 131, 135–138, 150, 152–153, 155, 183, 239–240, 246, 248

derived nominals, 2, 5, 34, 41, 53, 57, 94–95, 104, 110, 148, 159–167, 169, 171–176, 178–193
deverbal nominalization, 4–6, 93, 107, 130, 145, 154, 199–215
Direct causation, 165–167, 171, 174–176
Direct participation, 173–176, 178, 180
Discourse Representation Theory (DRT), 234, 236
Distributed Morphology (DM), 2, 13, 15, 27, 33–34, 52–53, 55–56, 67, 78, 93, 132, 149, 220, 224–229, 231, 233, 235, 237, 247

-*ee* nominalization, 15
-*er* nominalization, 1, 3, 9–16, 18–33
Event complexity, 161, 184, 188–193
Event identification, 177–178, 180, 183, 187, 192
event nominalization, 4, 6, 67–68, 73, 77–78, 219, 234
event noun, 61, 67, 87, 101, 199–201, 204, 212, 220
event type, 53, 161
events, 5, 12, 17, 27, 29, 42, 52, 84–85, 87, 101, 104, 109, 160–162, 164–167, 171–182, 188–193, 214, 236, 245
external argument, 3, 9–15, 19, 21, 25–30, 33, 47, 57–60, 108–110, 121, 129,

137–138, 146, 148, 150–151, 159–166, 170–174, 177–193, 208, 235, 245
~ generalization, 3, 9–12, 15, 25–26, 33
~ in nominalization, 33, 110, 129, 160, 179, 190, 245

gender nouns, 100
generic/dispositional operator, 21, 22, 24, 153
genitive, 6, 40, 47, 120, 162–166, 170, 172–175, 181, 183–185, 187, 193, 202–203, 206, 210, 219–226, 228–235, 237–244, 246–248
~ vs. prepositional phrase, 6, 219, 223
adjunct vs. argument ~, 223, 228
agent vs. theme ~, 6, 10, 17, 104, 161
associative ~, 6, 220

German, 6, 18, 26–27, 30, 32–33, 164, 167, 201, 214, 219–222, 224–226, 229, 235, 244, 247

identity, 4, 41, 47, 177, 186
-ing nominalization, 1, 3, 58, 88, 180
ing of gerunds, 159–162, 188
intersective/non-intersective interpretation, 15, 135, 137

Lexical-Functional Grammar, 223

-ment, 159

nominalization, 2, 4–6, 12–13, 23, 46–48, 52, 68, 70, 72–77, 80–81, 83–88, 94, 96–101, 103, 106–107, 111, 114, 116–118, 125, 130–132, 139–140, 144, 159–161, 163–164, 169–171, 179, 188–191, 199–200, 204, 209–215, 220, 222–223, 229, 233, 236–239, 241, 246–247
nouns, 1–4, 6, 10, 14–18, 20, 23–24, 27, 29–30, 32–34, 41–42, 47, 59–61, 63–64, 67, 69–70, 78, 85–87, 93–111, 117–118, 120, 122–123, 125, 130, 133–135, 141, 144–145, 148, 151–152, 169–170, 182, 193, 199–206, 209–213, 215, 219–224, 231, 233, 235–238, 241, 243, 245–248
relational ~, 6, 152, 219–220, 240–241, 248

participant-structure nominals, 107–108, 110–111
participial morphology, 41, 45, 47–49, 64, 86
passive nominals, 104, 182–183, 186–187
past participle, 67, 71, 75–78, 81, 83–85, 87, 116
possessive construction, 245
pragmatics, 31
prepositional phrase, 6, 74, 219, 223, 232
process -NE nominals, 96, 104, 109–110
property denoting ~, 155

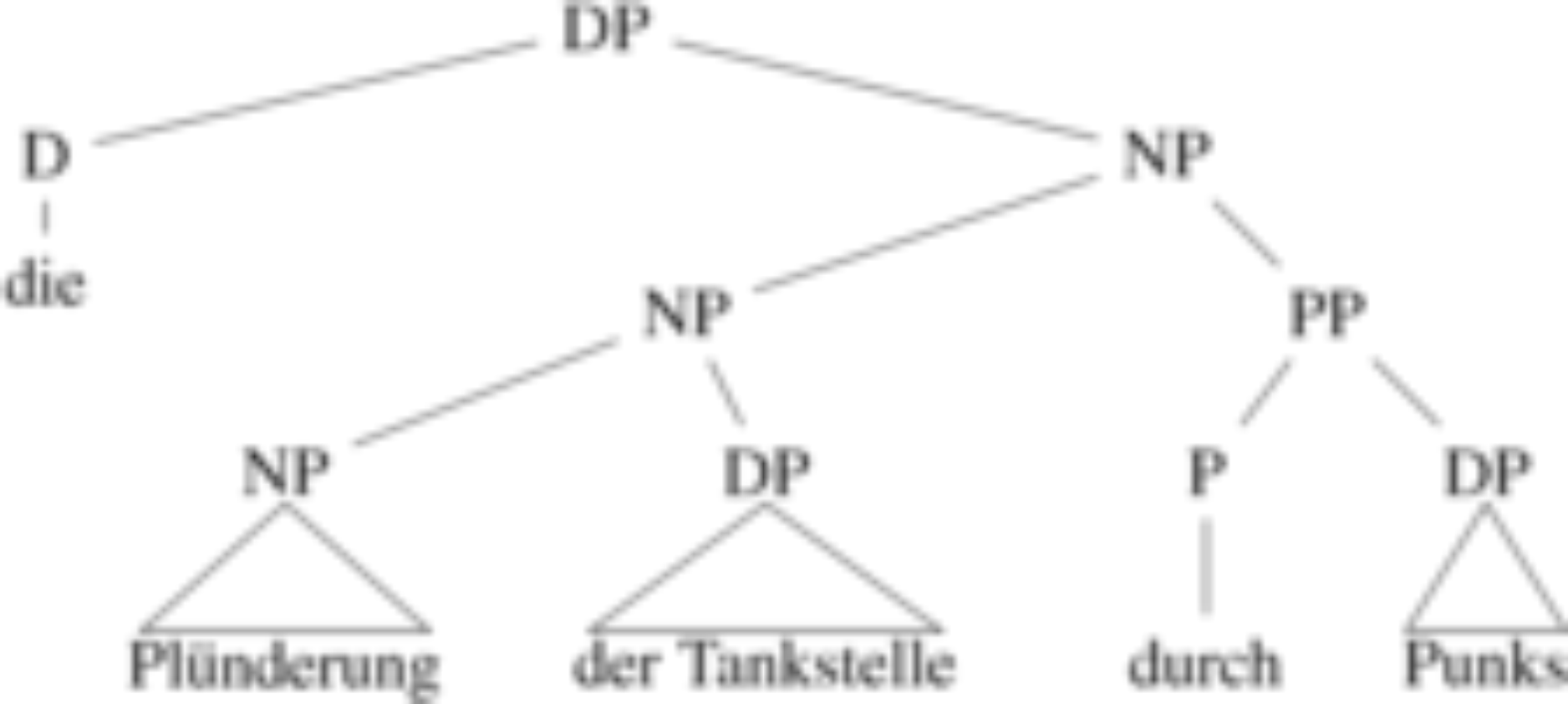
r(eferential)-argument, 14–15, 237, 238–239, 241, 245–246
result nominals, 39, 41–43, 54, 56–57, 59–60, 63–64, 95, 107–108, 145, 150, 154–155, 200
resultative construction, 190
roots, 2–4, 9, 13–18, 22, 27, 30, 32–34, 39, 41, 49–51, 59, 78–79, 83, 88, 93, 98–101, 103, 105–106, 108, 114, 124, 129, 150, 161, 163–167, 171, 173, 175, 180, 192, 199, 204–206, 210–213, 215, 225, 231

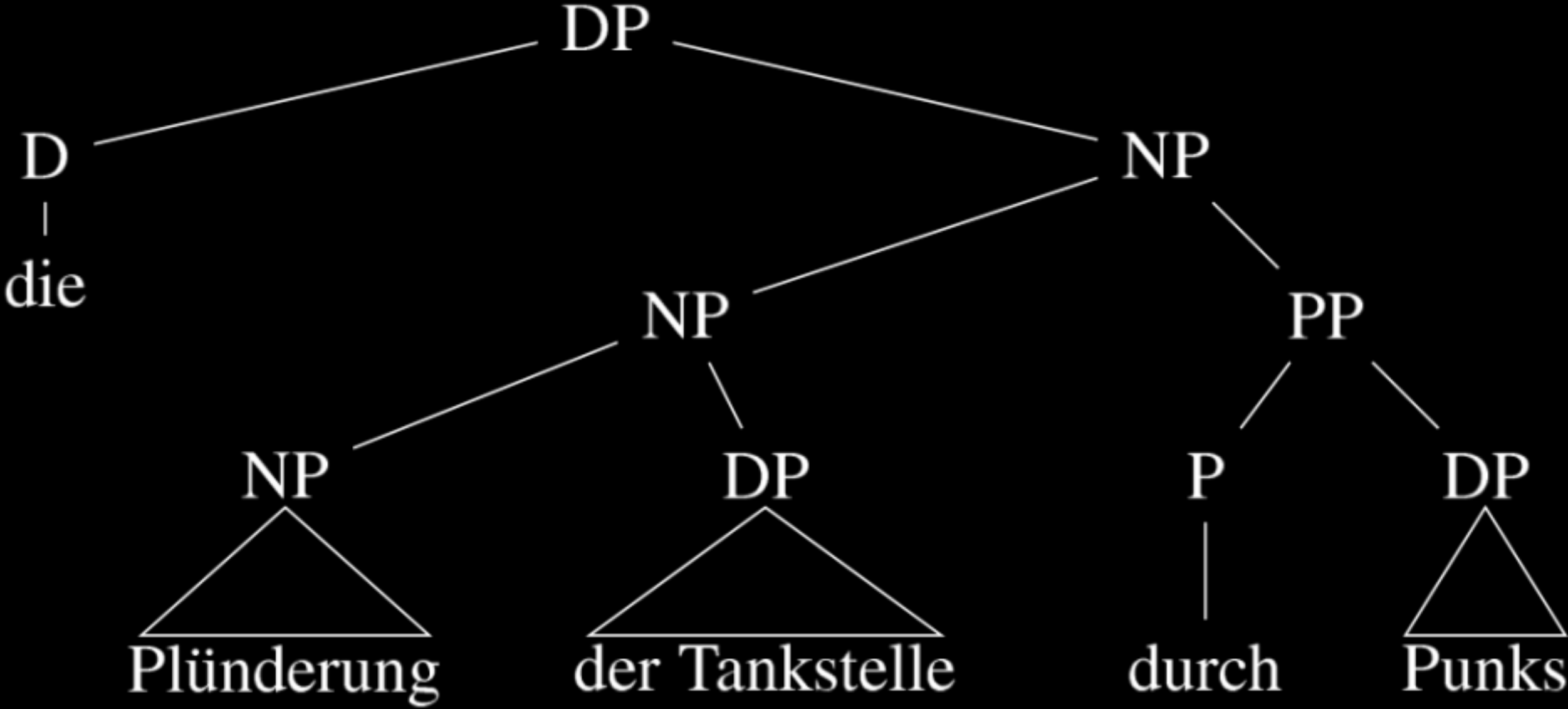
semantics, 13, 23–24, 33–34, 73, 82, 85, 98, 102, 132, 134, 137, 139, 221, 232–233, 235, 237, 245, 248
Serbian, 3, 39–42, 44–47, 50–52, 54, 58–61, 64
simple events, 5, 161, 167, 178–181, 213
Spanish, 4, 17, 19, 29, 67–69, 72, 77–78, 83, 85, 88
stages, 97, 193, 232

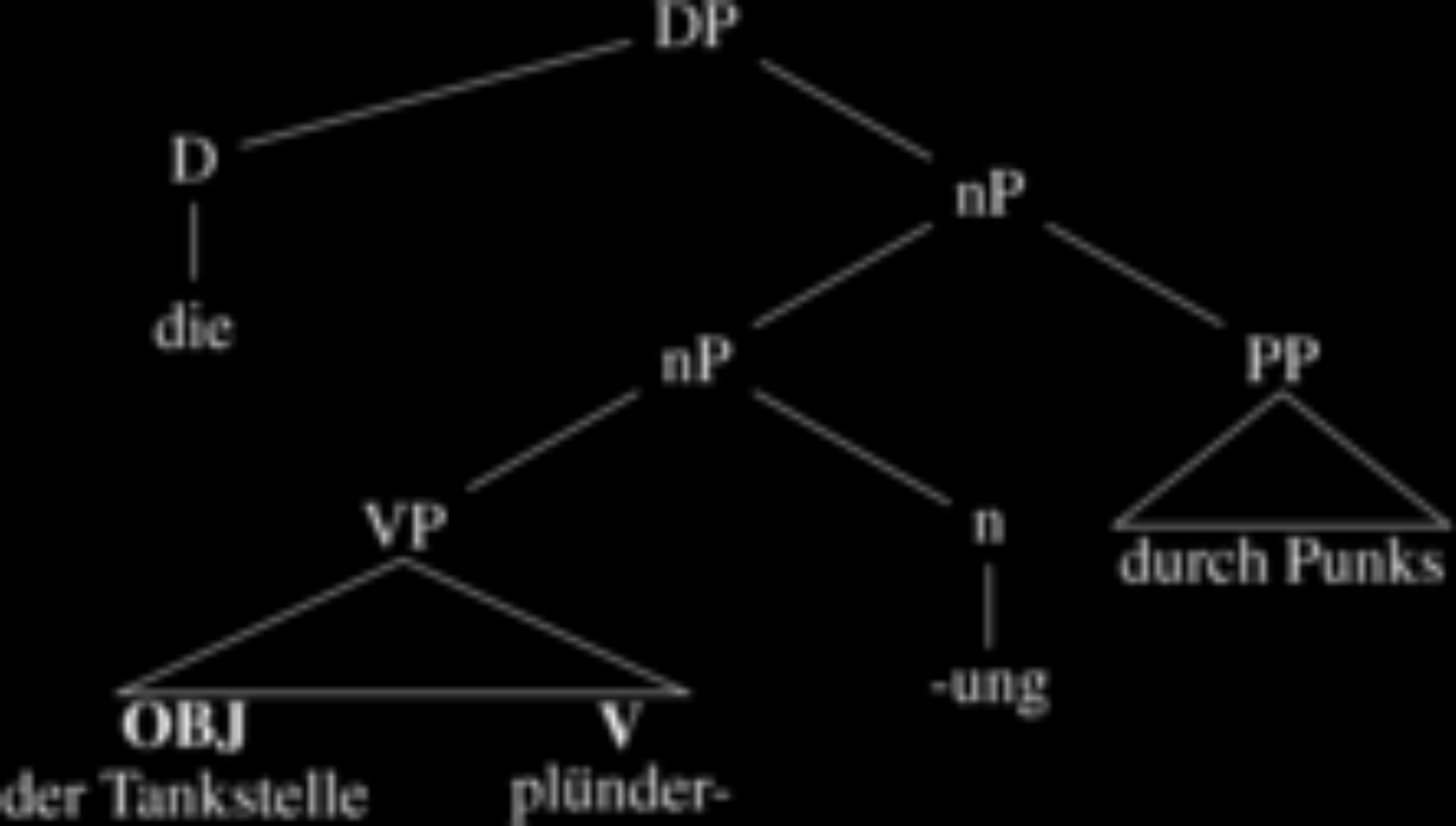
thematic vowels, 46, 51, 59, 94, 101–106, 108, 110, 125

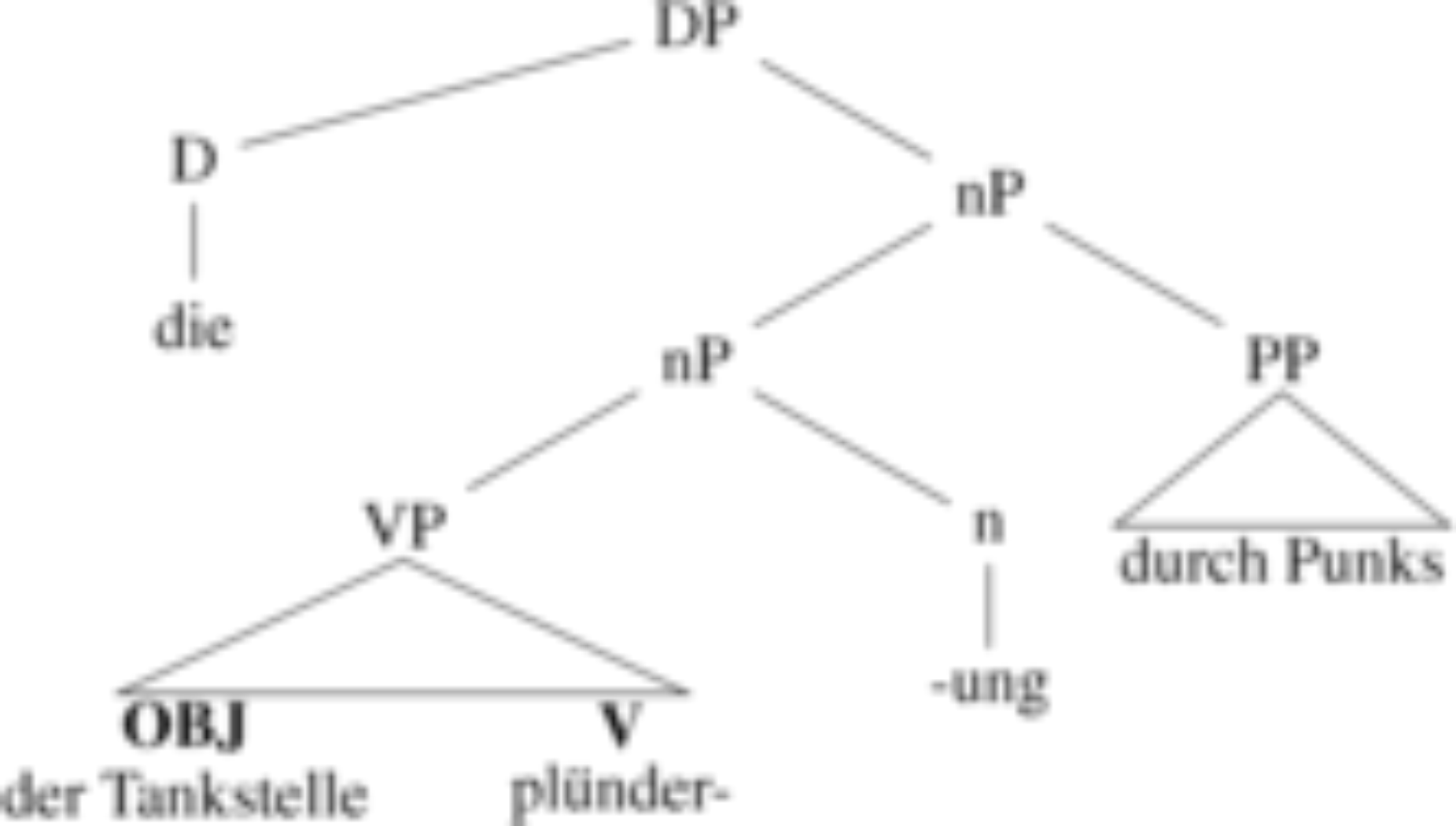
underspecification, 233
  constraining ~, 233
Underspecified Discourse Representation Theory (UDRT), 234–235
underspecified semantic representations, 220
-ung nominals, 222, 225–226, 229, 235, 239, 246
verbal stems, 98, 114
verbalizer, 41, 55–57, 102
verbalizing morphology, 15, 17, 28, 52
verbs of contact, 180
voice, 14–16, 19, 22, 27, 94, 96, 103–104, 106–108, 110, 113, 116, 118, 123, 186, 211, 225, 229, 232
  IE nouns, 97, 118

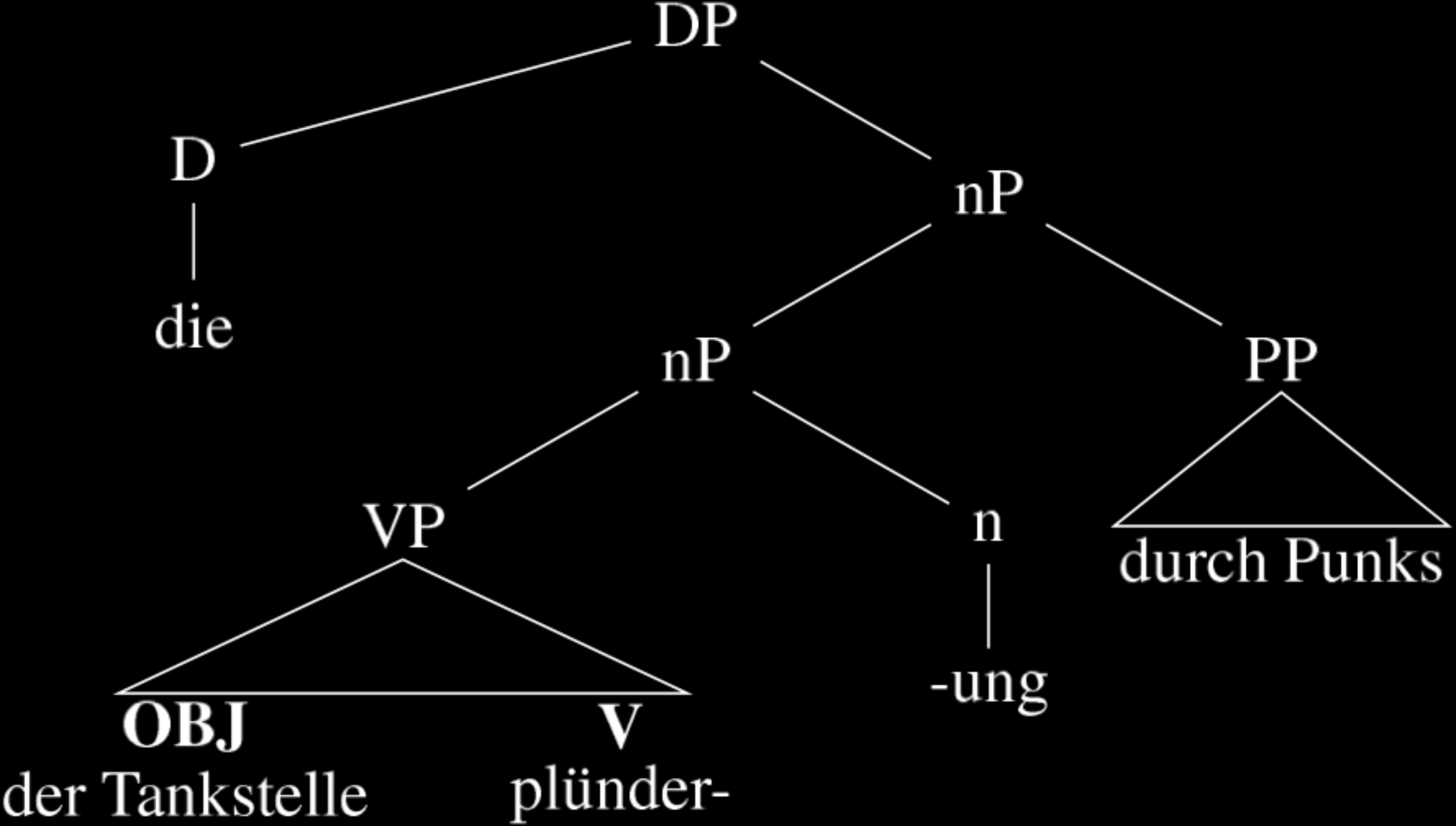

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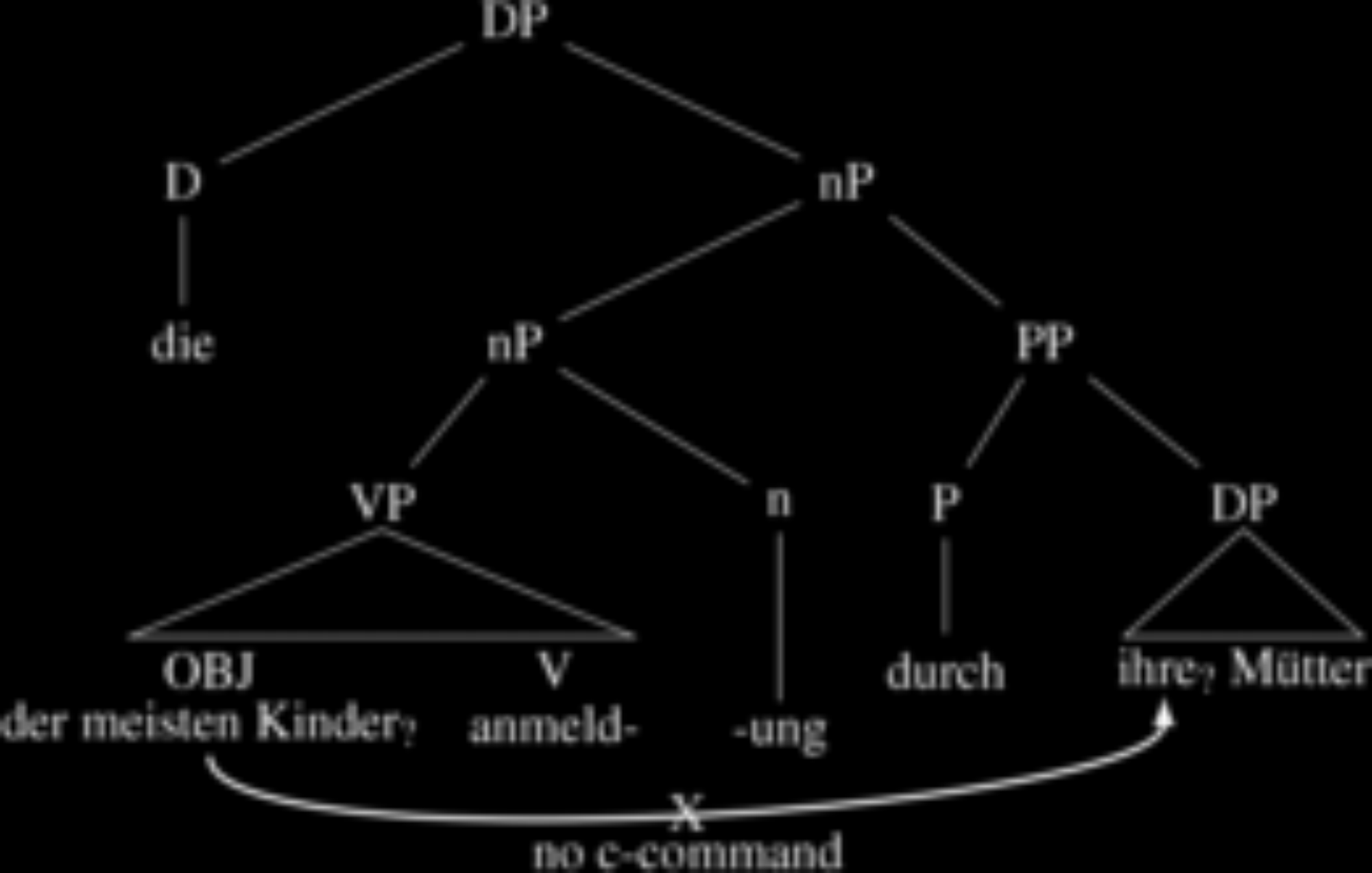

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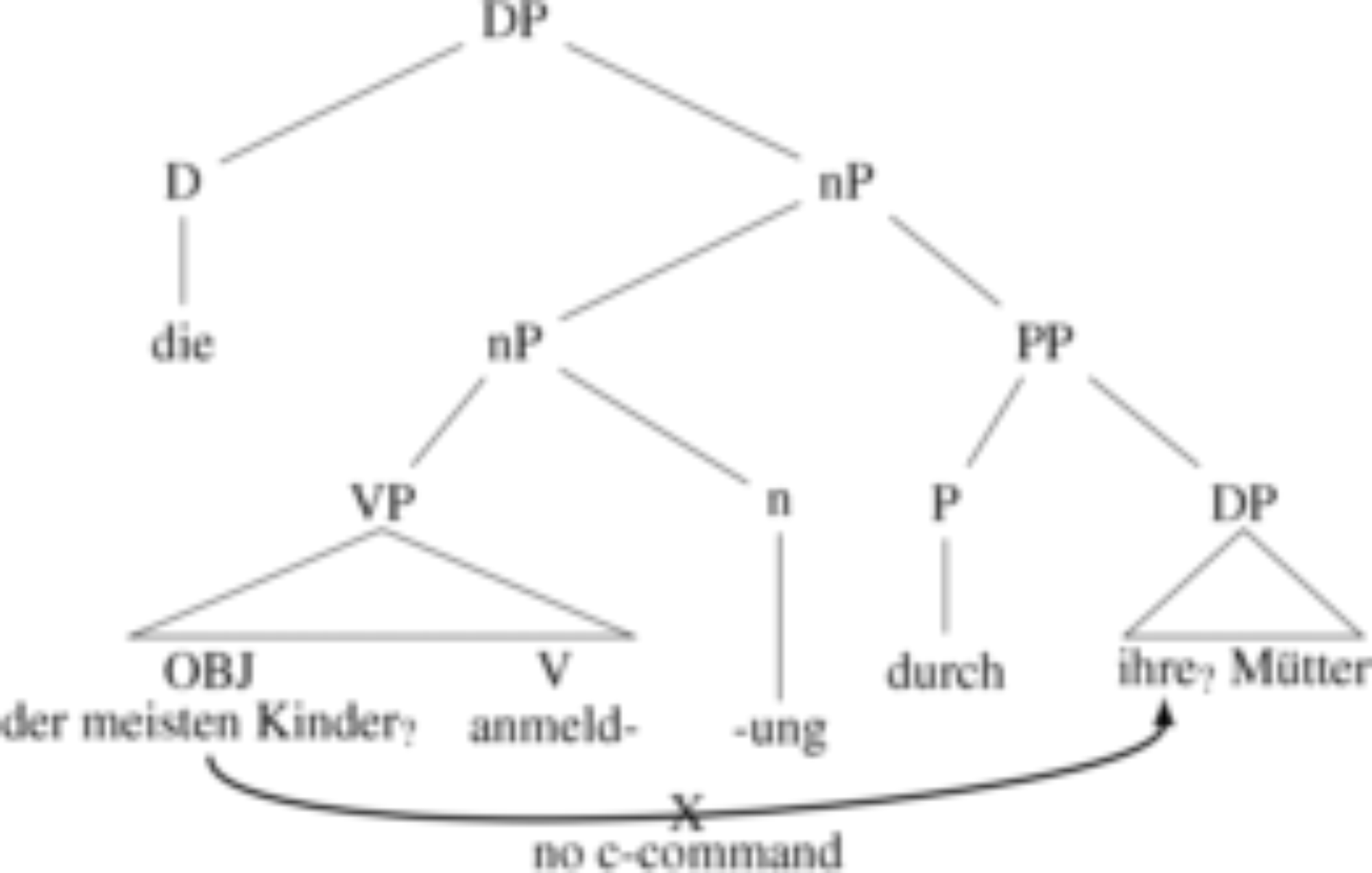

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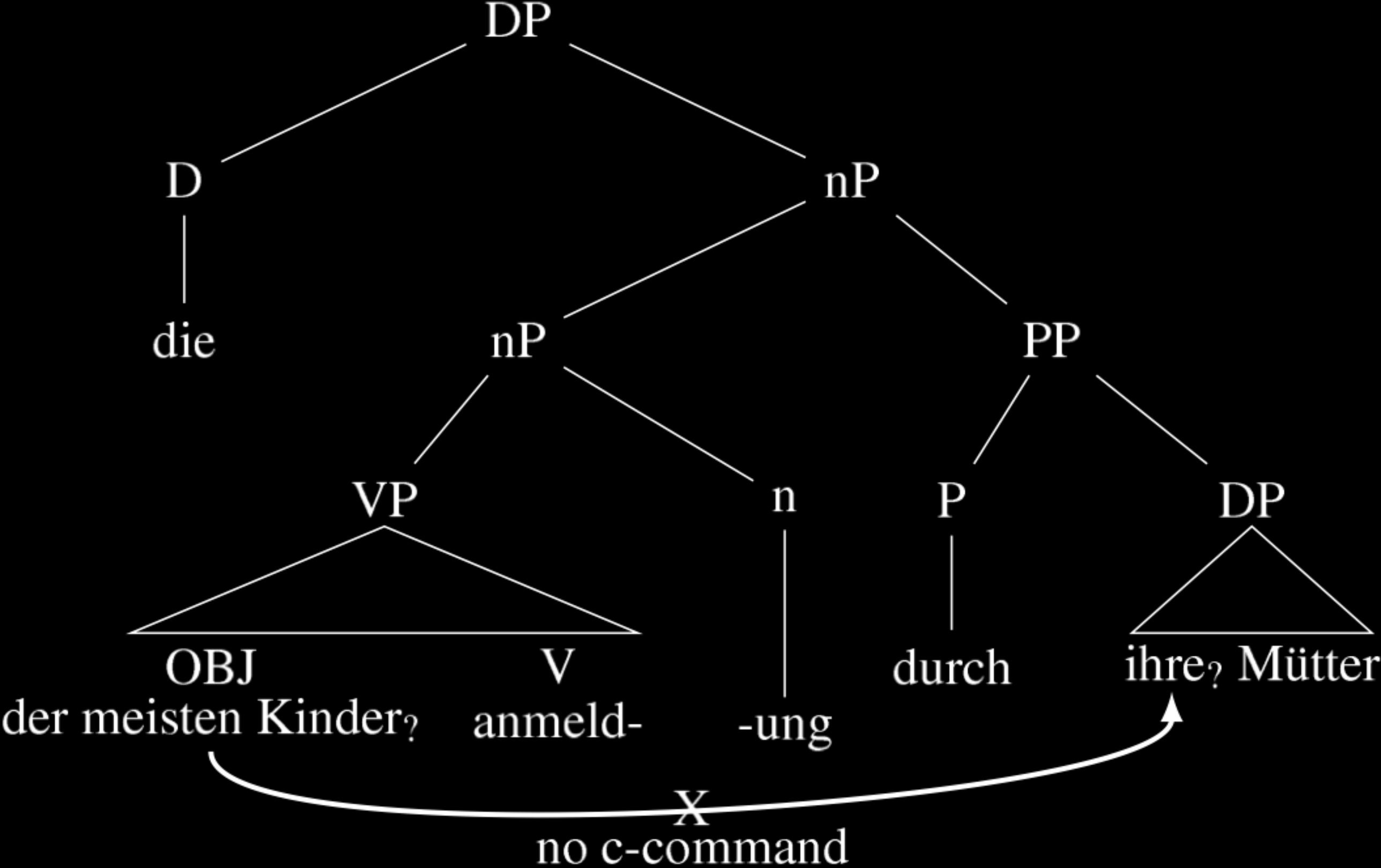

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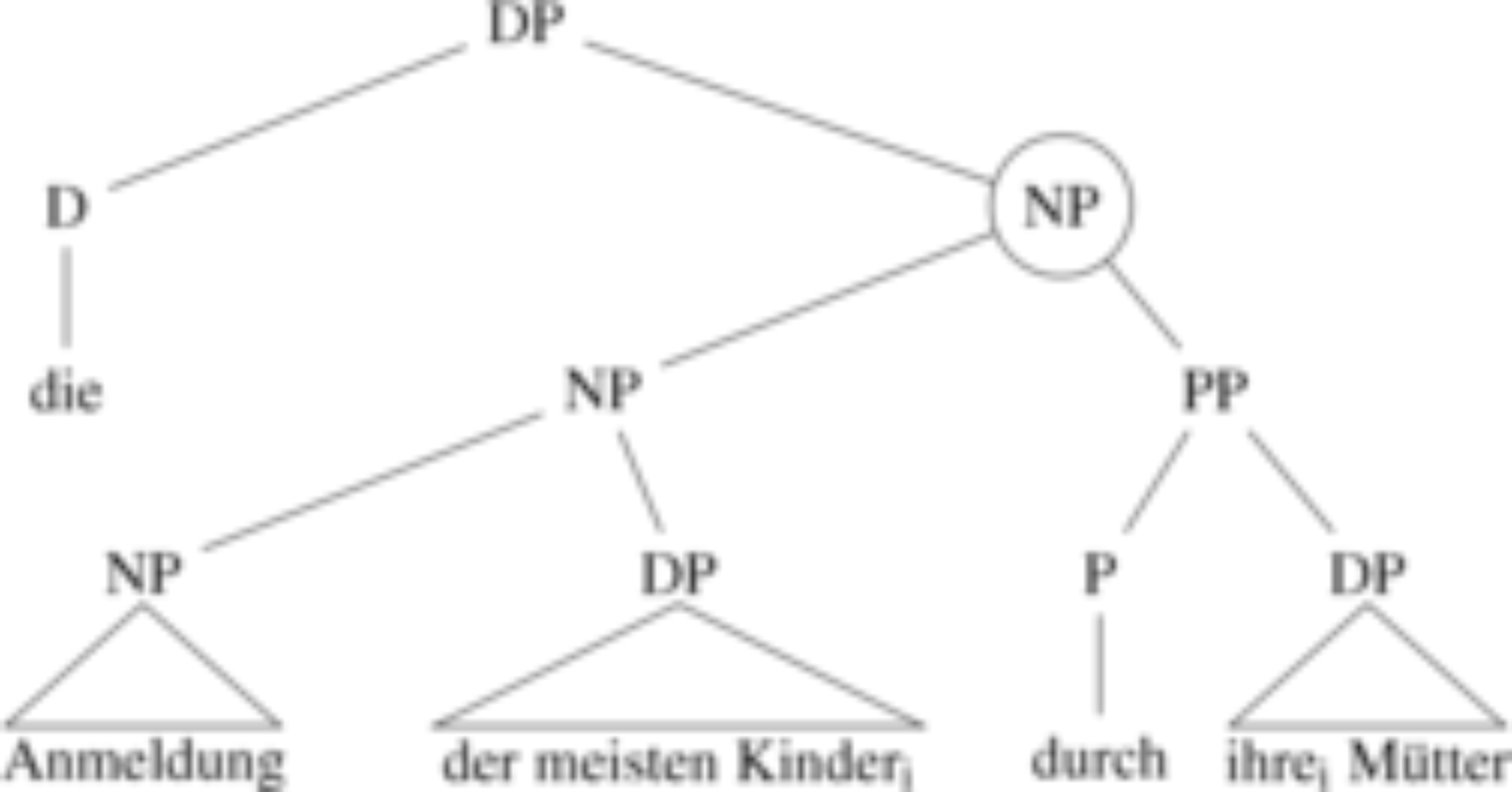

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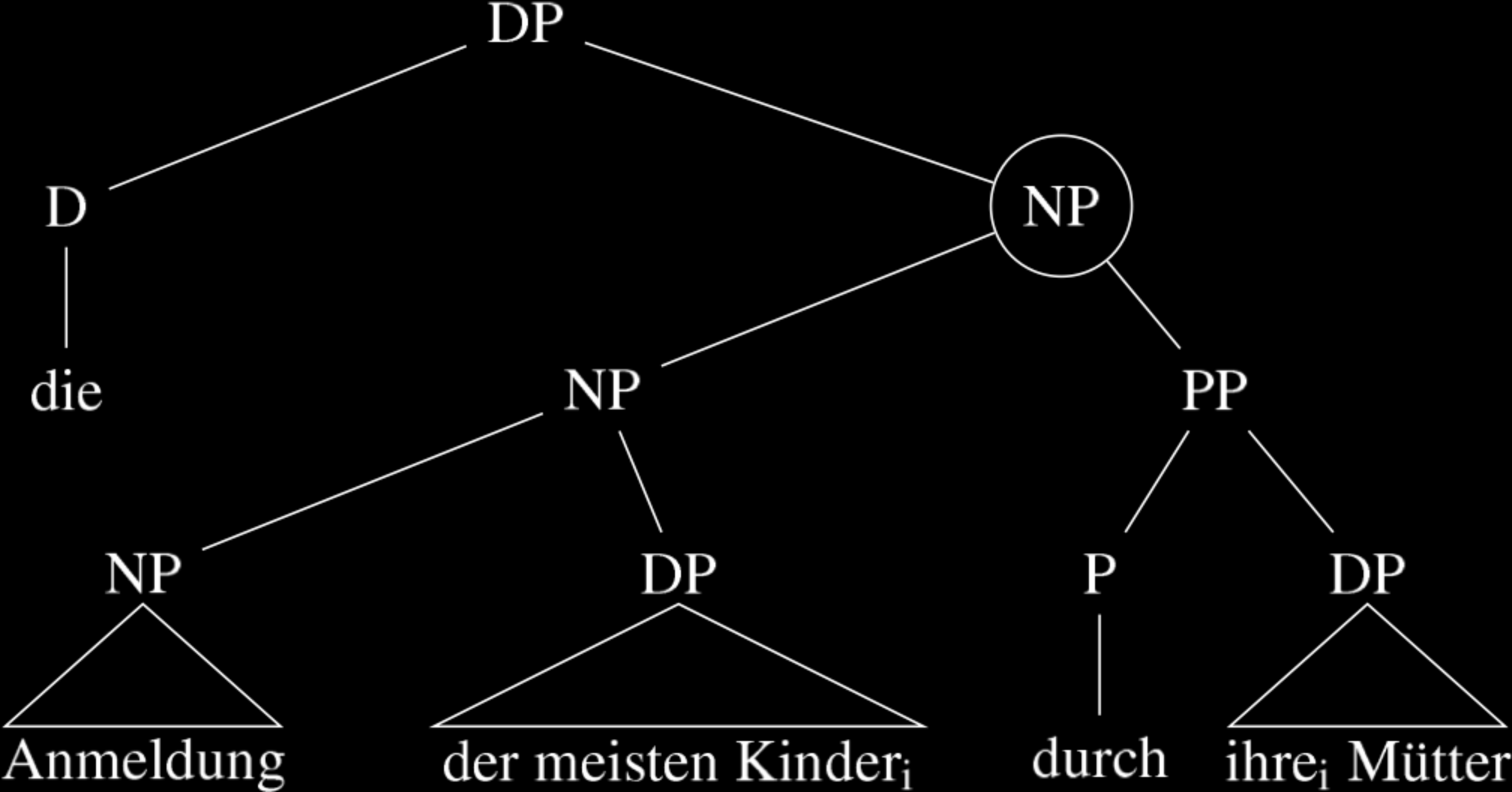

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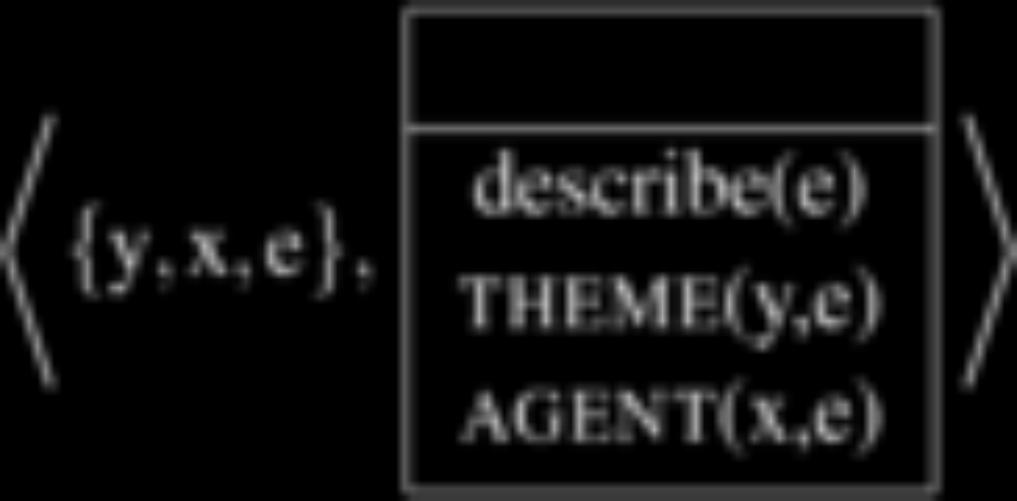

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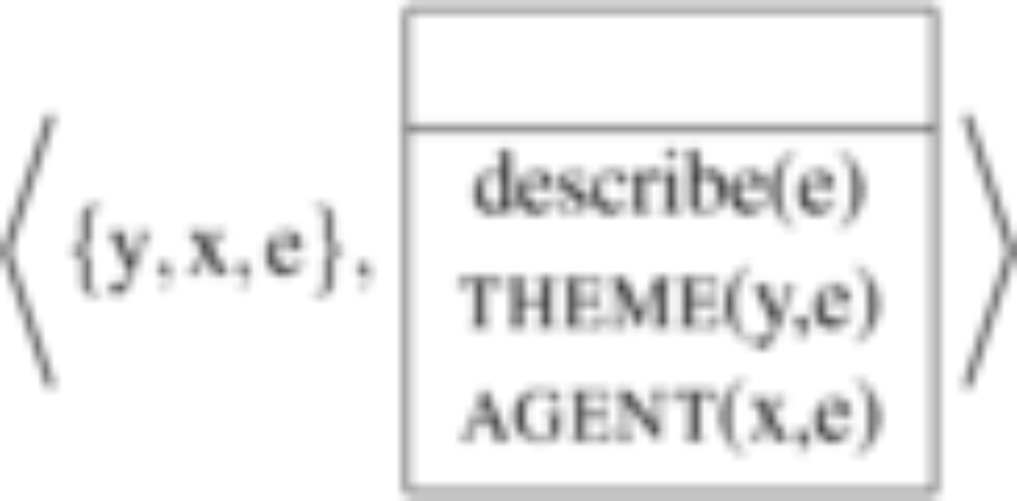

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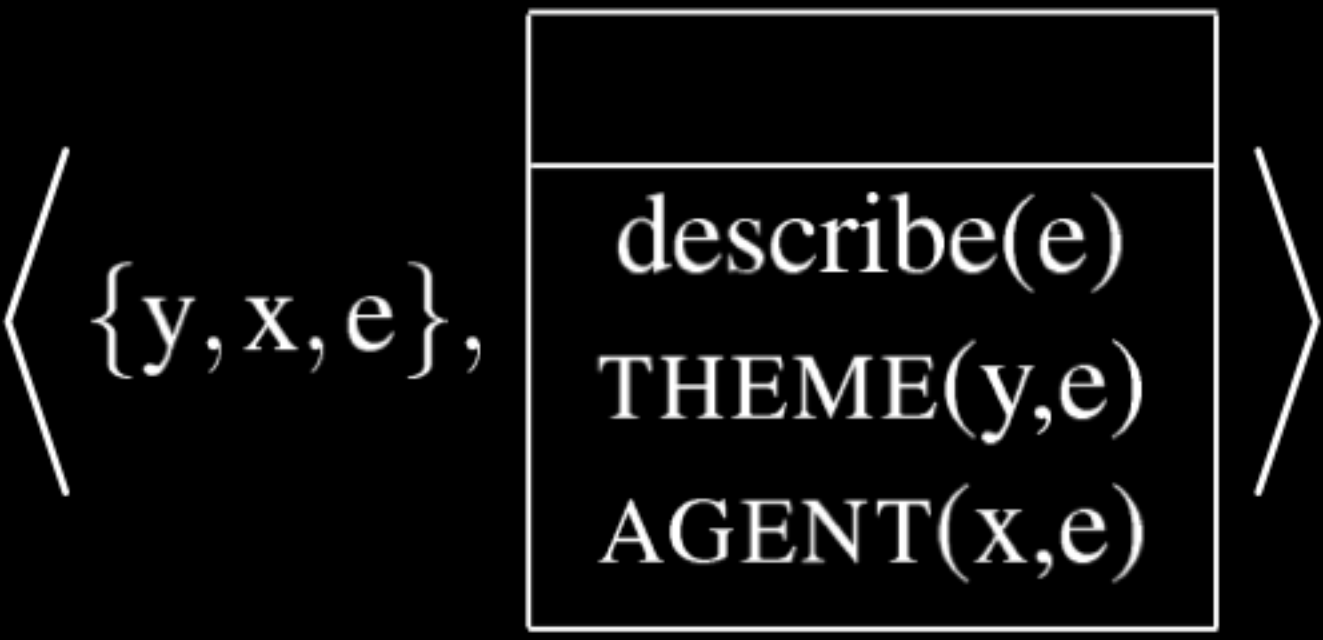

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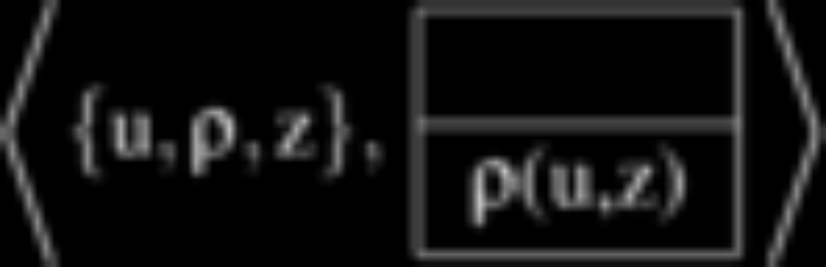

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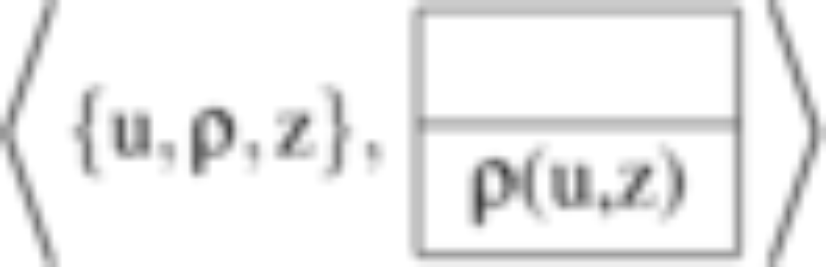

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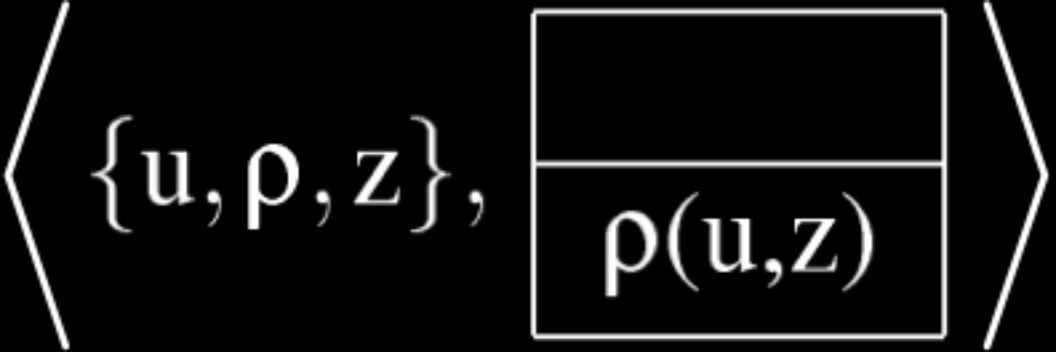

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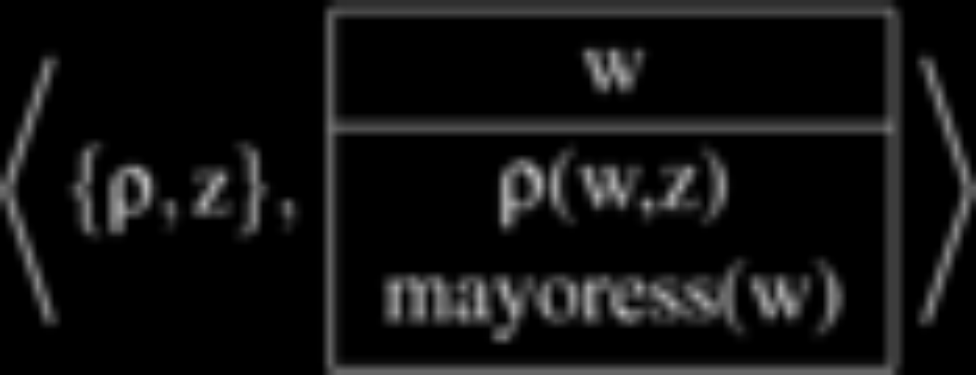

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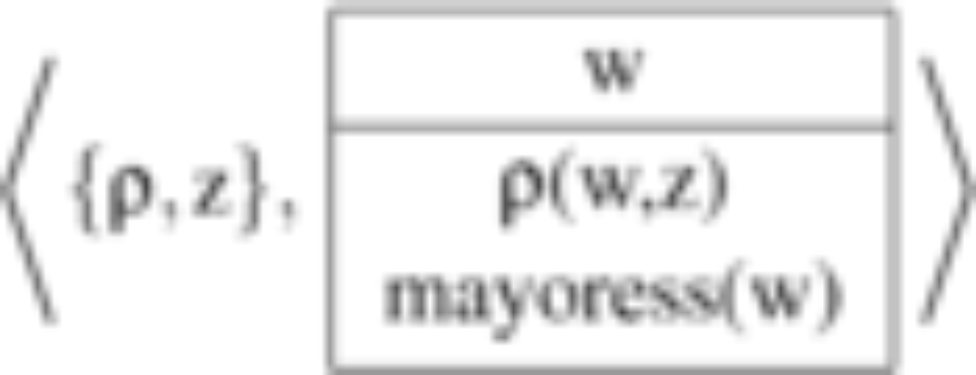

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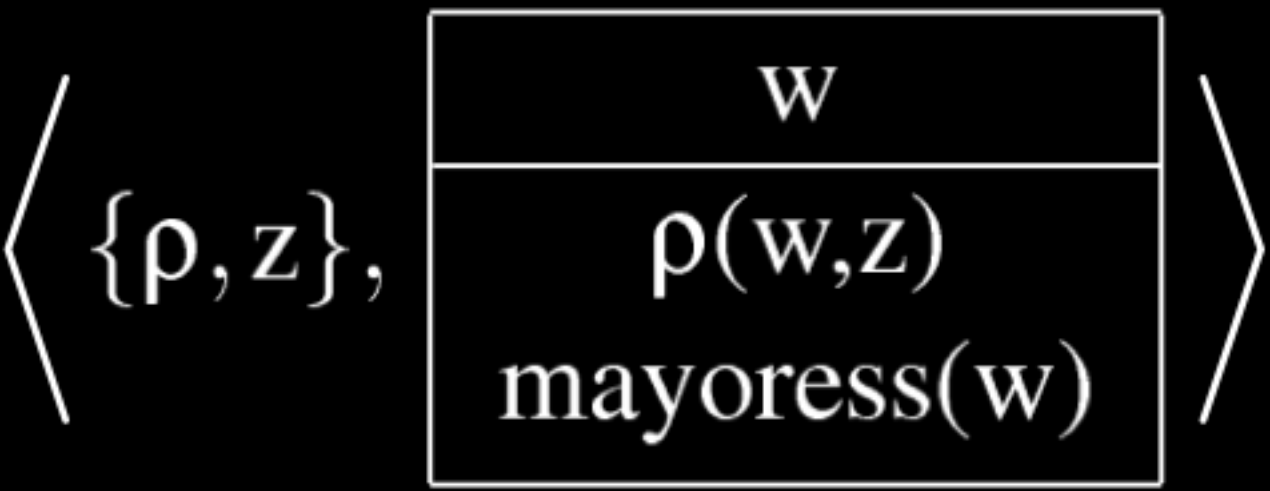

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ρ(u,z)

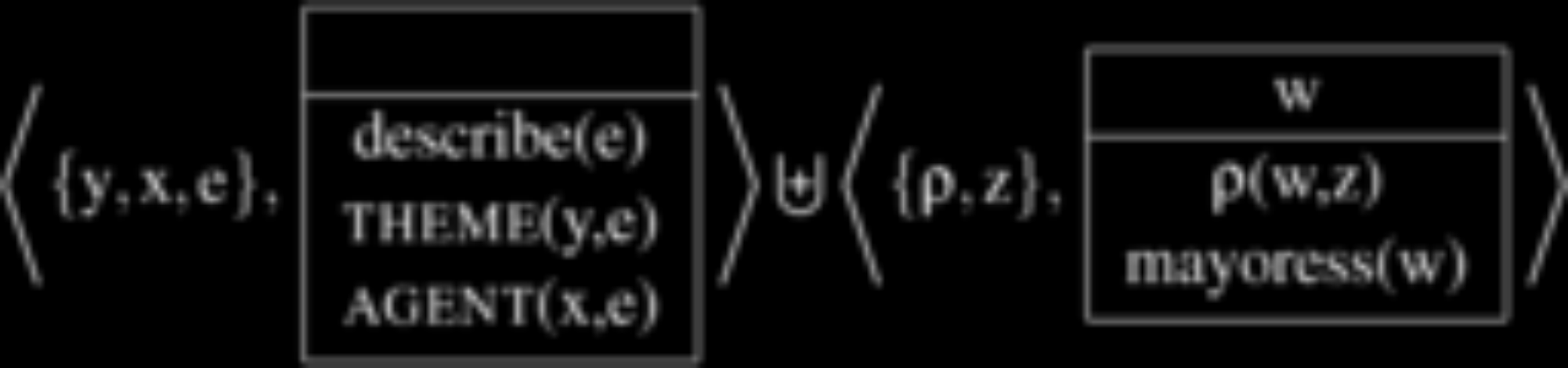

{u, ρ, z},
ρ(u,z)

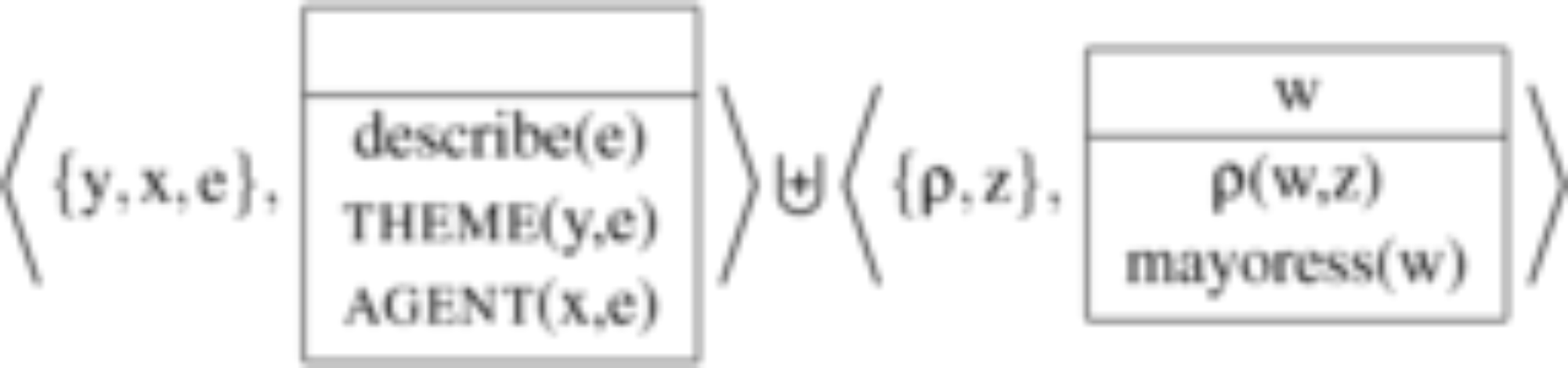

{u, ρ, z},
ρ(u,z)

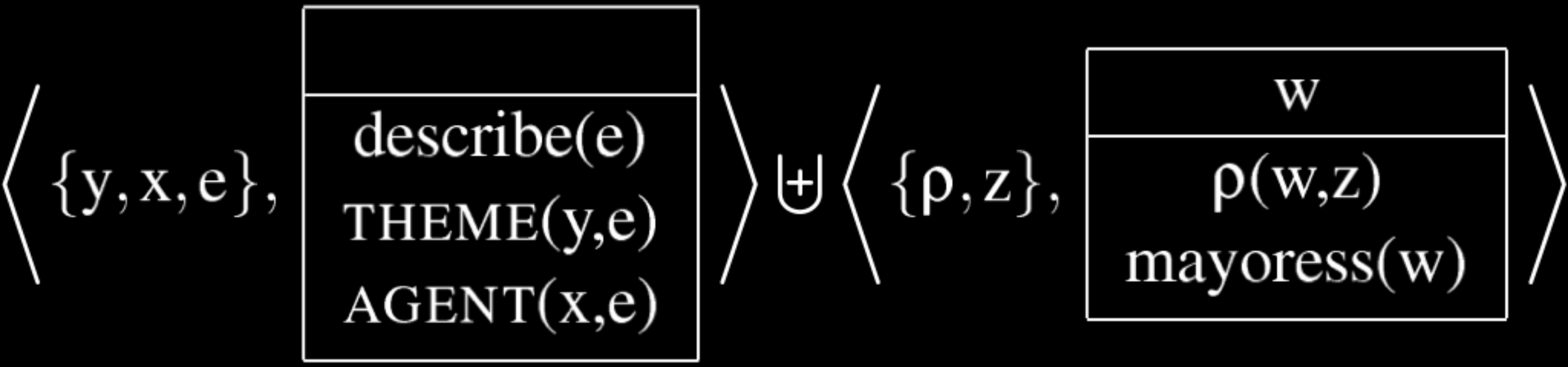

{ρ, z},
w
ρ(w,z)
mayoress(w)

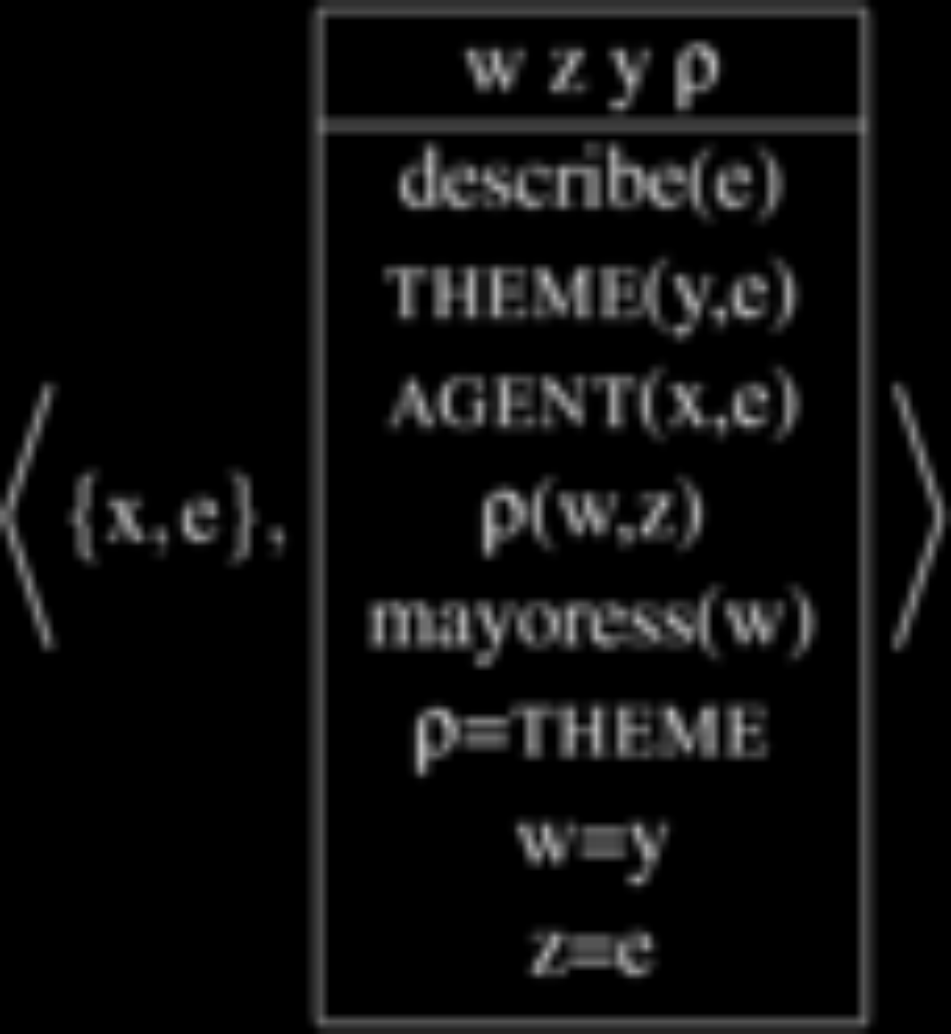

{ρ, z},
w
ρ(w,z)
mayoress(w)


{ρ, z},
w
ρ(w,z)
mayoress(w)

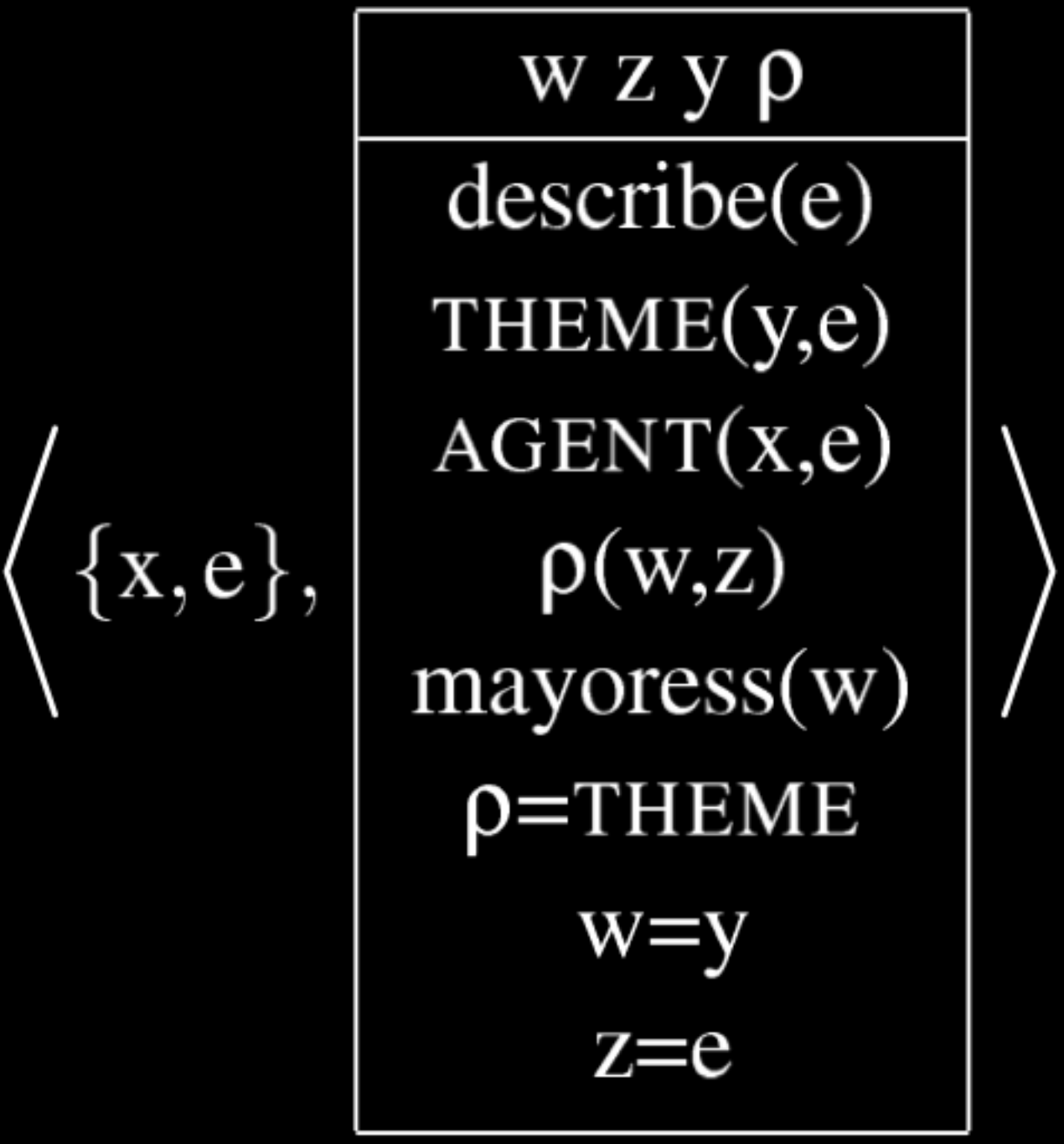

{y, x, e},
describe(e)
THEME(y,e)
AGENT(x,e)
⊎
{ρ, z},
w
ρ(w,z)
mayoress(w)

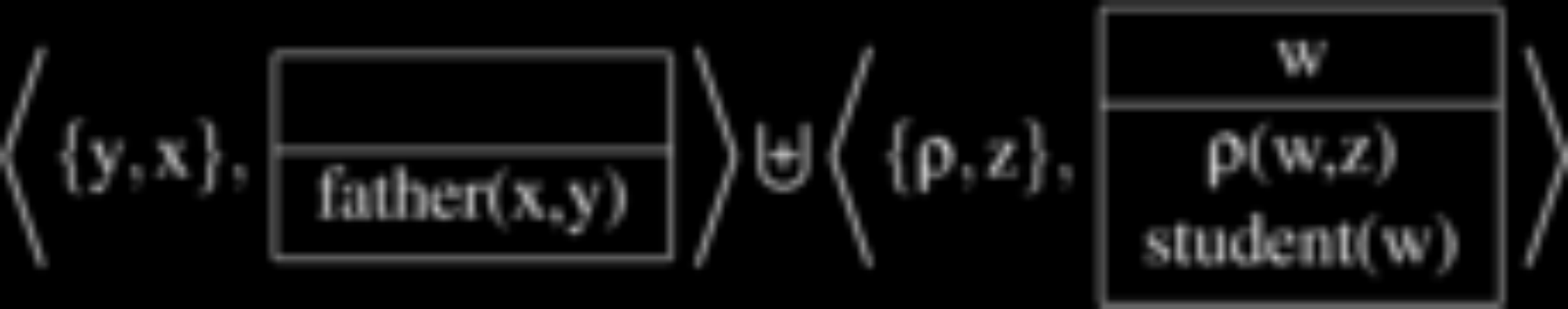

{y, x, e},
describe(e)
THEME(y,e)
AGENT(x,e)
⊎
{ρ, z},
w
ρ(w,z)
mayoress(w)

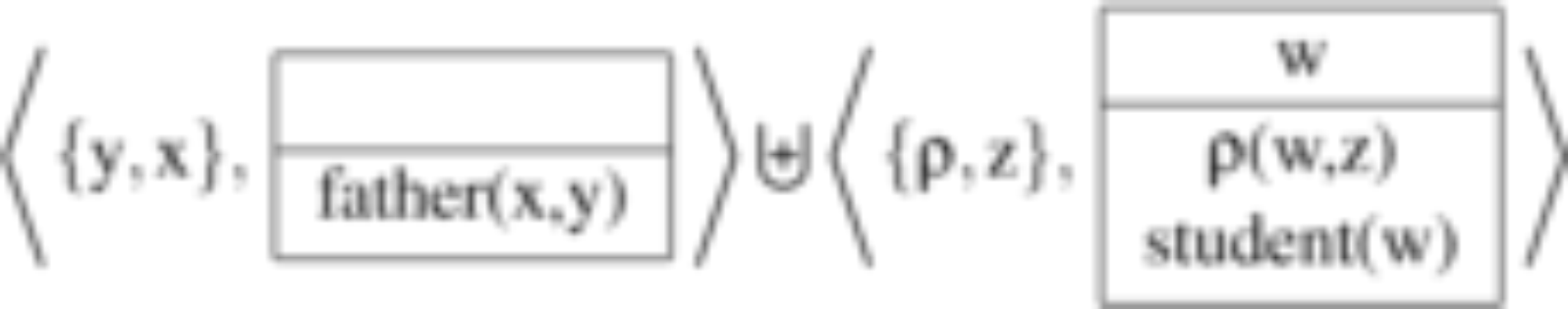

{y, x, e},
describe(e)
THEME(y,e)
AGENT(x,e)
⊎
{ρ, z},
w
ρ(w,z)
mayoress(w)

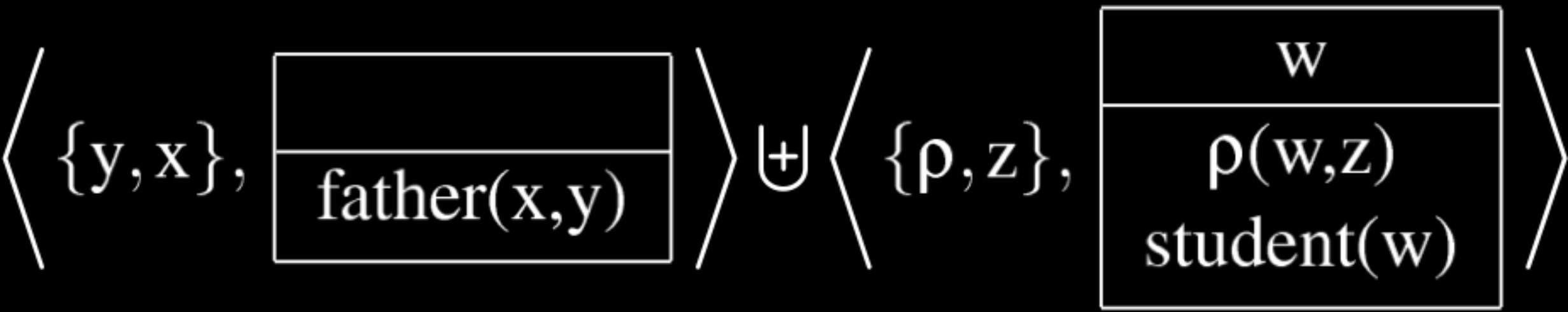

w z y ρ
describe(e)
THEME(y,e)
AGENT(x,e)
ρ(w,z)
mayoress(w)
ρ=THEME
w=y
z=e
⟨ {x,e},
⟩

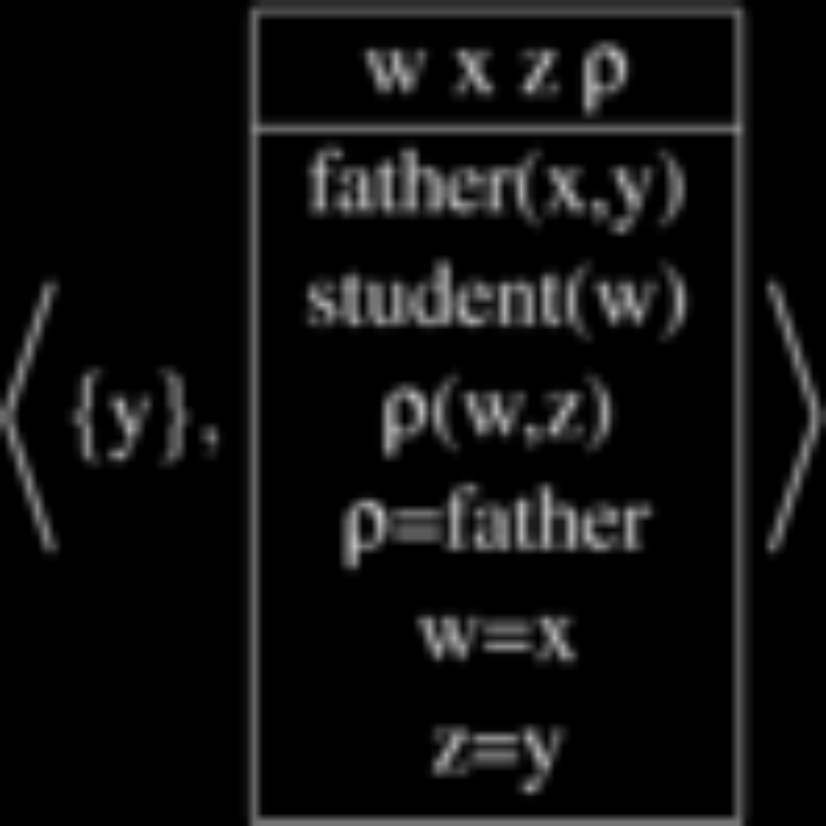

w z y ρ
describe(e)
THEME(y,e)
AGENT(x,e)
ρ(w,z)
mayoress(w)
ρ=THEME
w=y
z=e
{x,e},

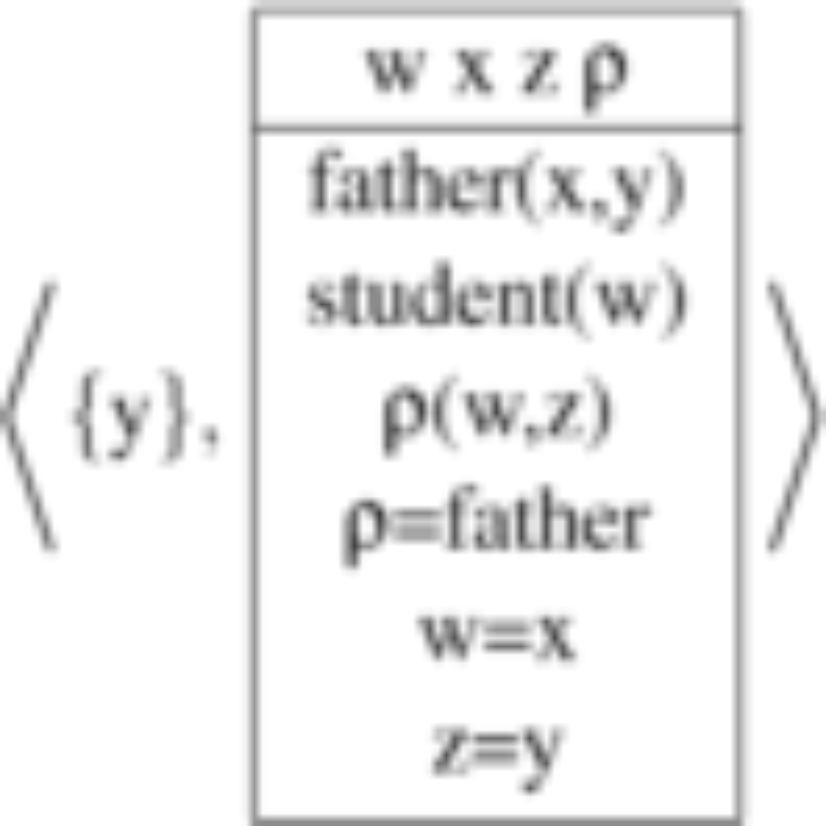

w z y ρ
describe(e)
THEME(y,e)
AGENT(x,e)
ρ(w,z)
mayoress(w)
ρ=THEME
w=y
z=e
{x, e},

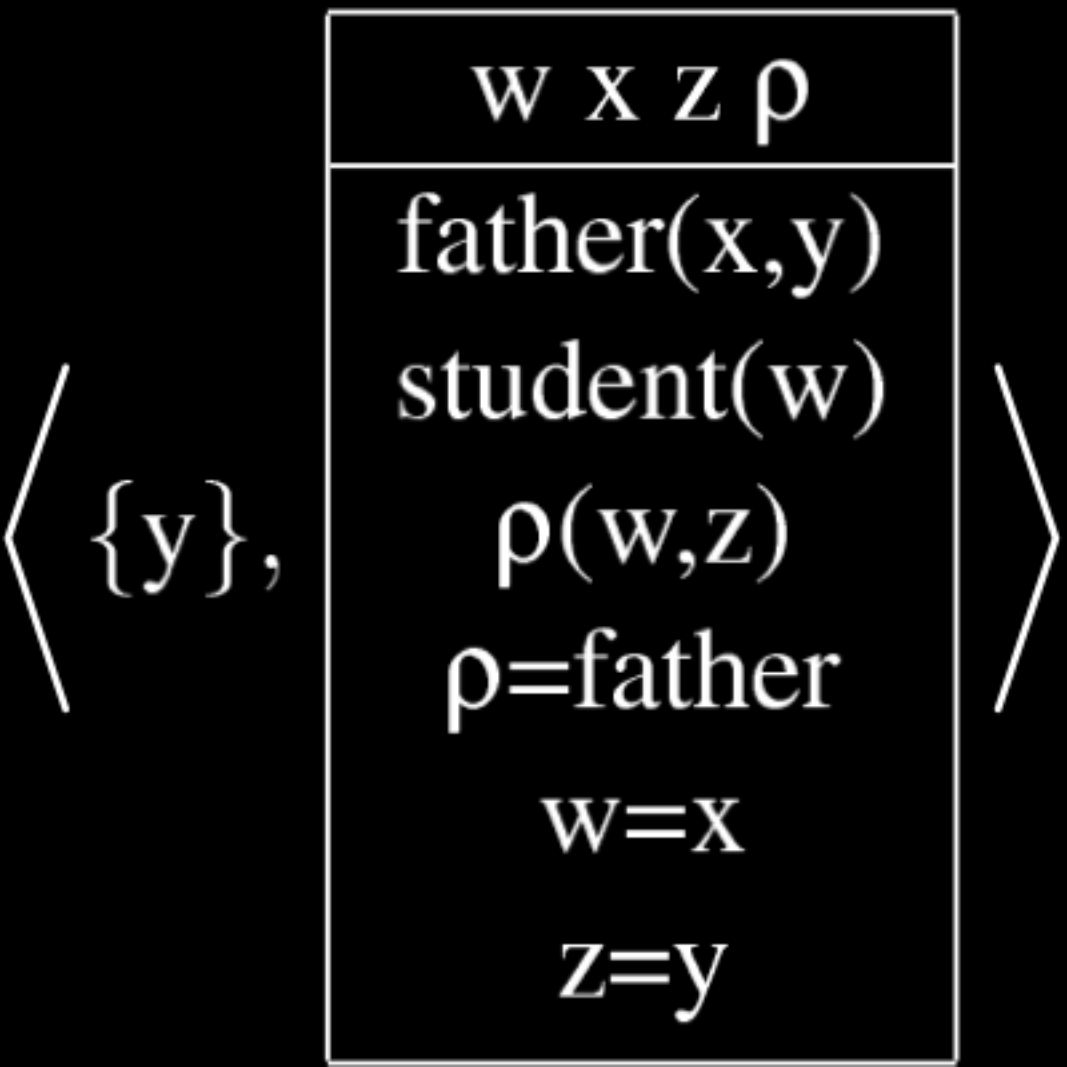

{y,x},
father(x,y)
⊎
{ρ,z},
w
ρ(w,z)
student(w)

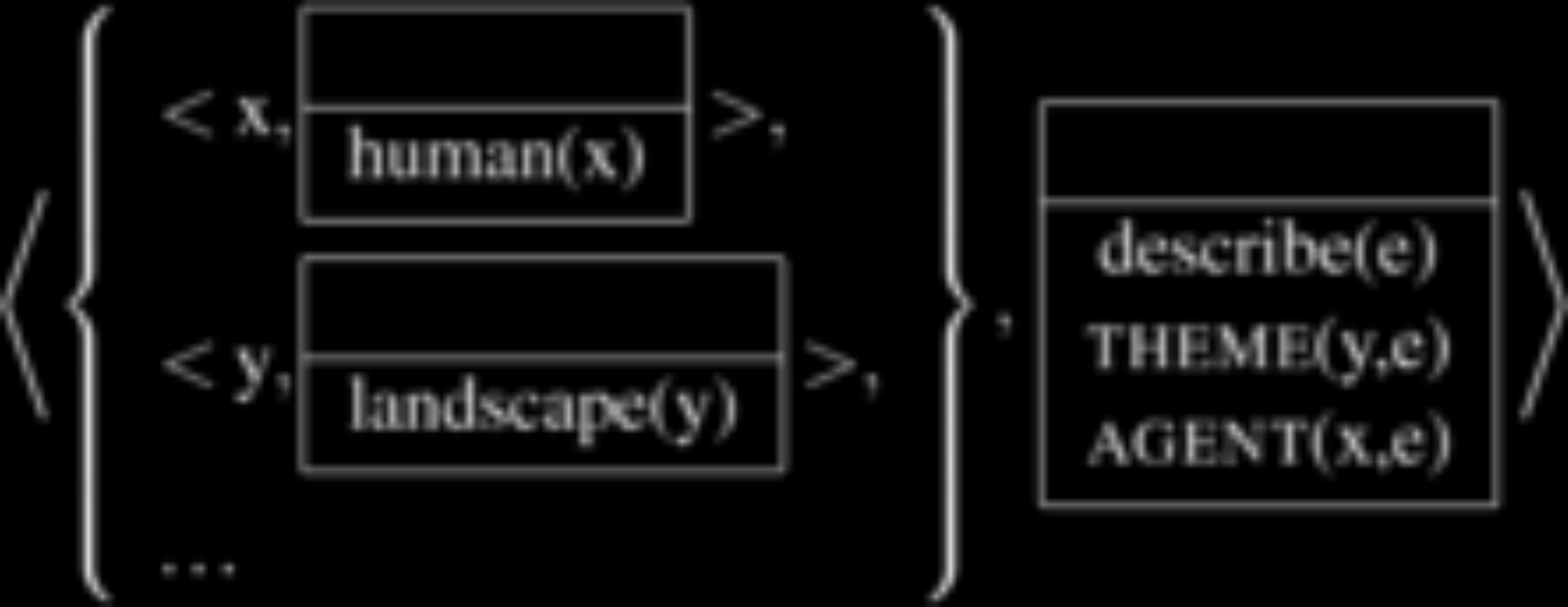

{y, x},
father(x,y)
⊎
{ρ, z},
w
ρ(w,z)
student(w)

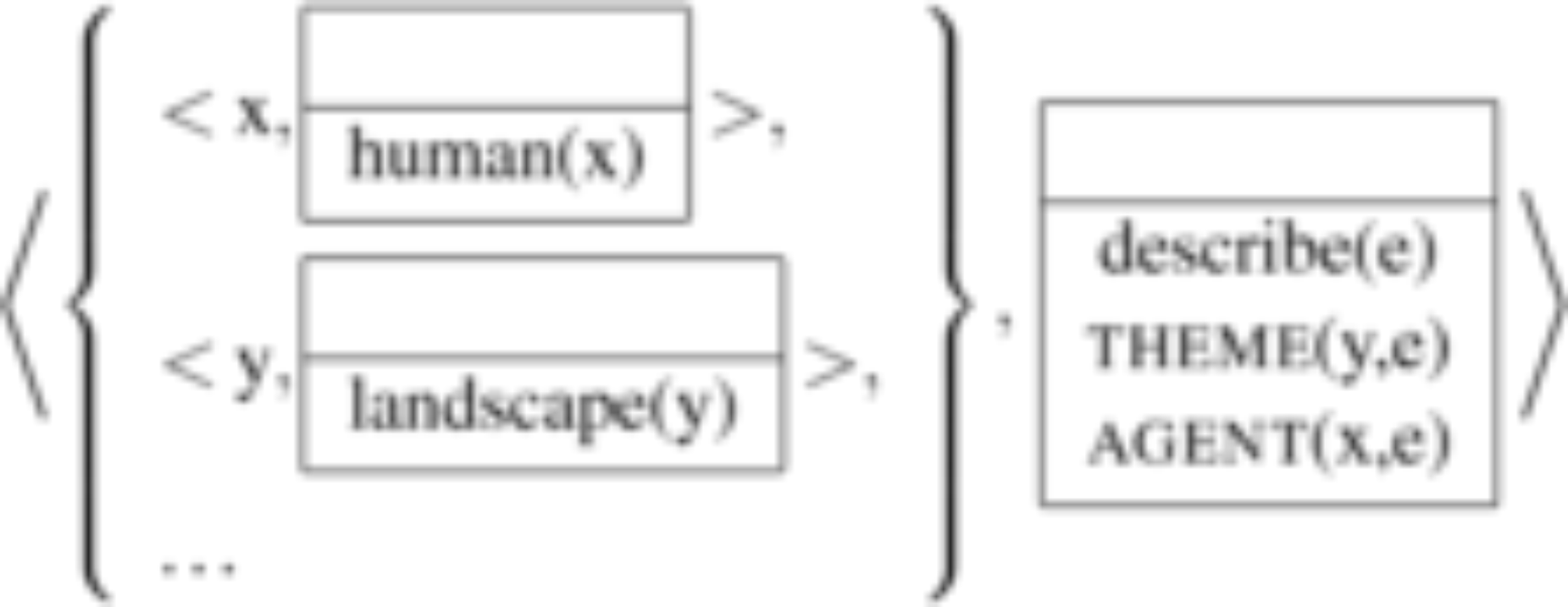

{y,x}
father(x,y)
⊎
{ρ,z}
w
ρ(w,z)
student(w)

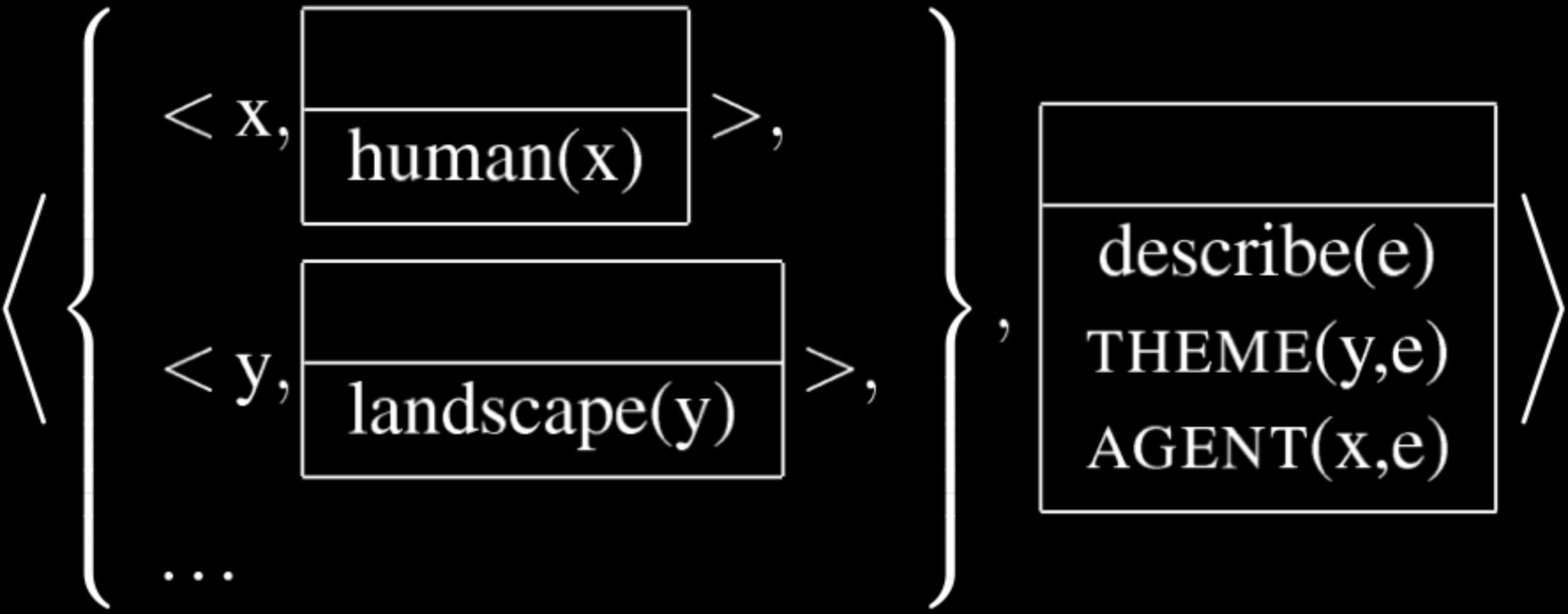

w x z ρ
father(x,y)
student(w)
ρ(w,z)
ρ=father
w=x
z=y
⟨ {y},
⟩


w x z ρ
father(x,y)
student(w)
ρ(w,z)
ρ=father
w=x
z=y
{y},


w x z ρ
father(x,y)
student(w)
ρ(w,z)
ρ=father
w=x
z=y
{y},

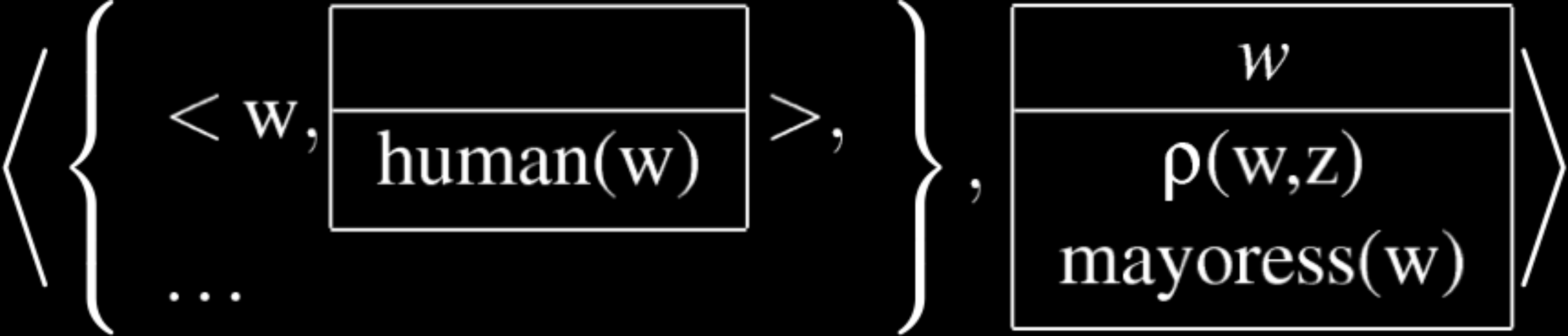

< x,
human(x)
>,
< y,
landscape(y)
>,
...
describe(e)
THEME(y,e)
AGENT(x,e)


< x,
human(x)
>,
< y,
landscape(y)
>,
...
describe(e)
THEME(y,e)
AGENT(x,e)


< x,
human(x)
>,
< y,
landscape(y)
>,
. . .
describe(e)
THEME(y,e)
AGENT(x,e)


< w,
human(w)
>,
...
,
w
ρ(w,z)
mayoress(w)


< w,
human(w)
>,
...
w
ρ(w,z)
mayoress(w)

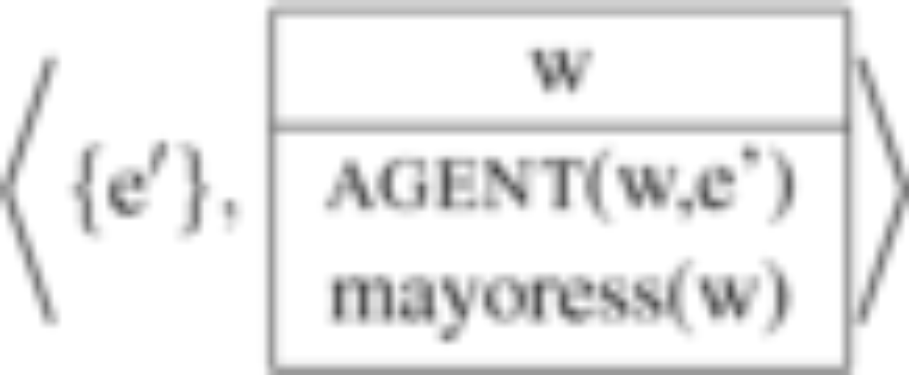

< w,
human(w)
>,
. . .
w
ρ(w,z)
mayoress(w)


{v,e'},
AGENT(v,e')

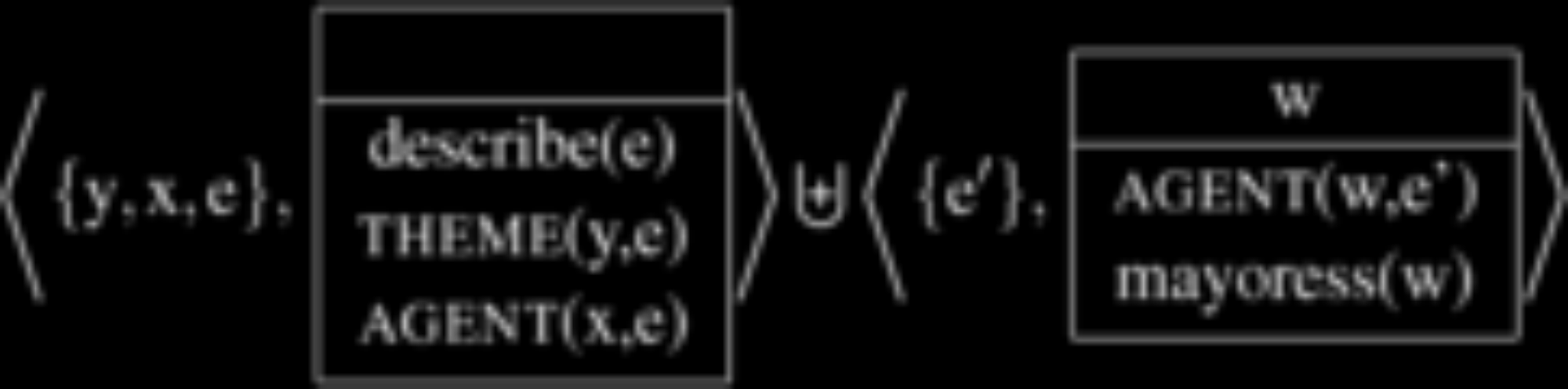

{v,e'},
AGENT(v,e')

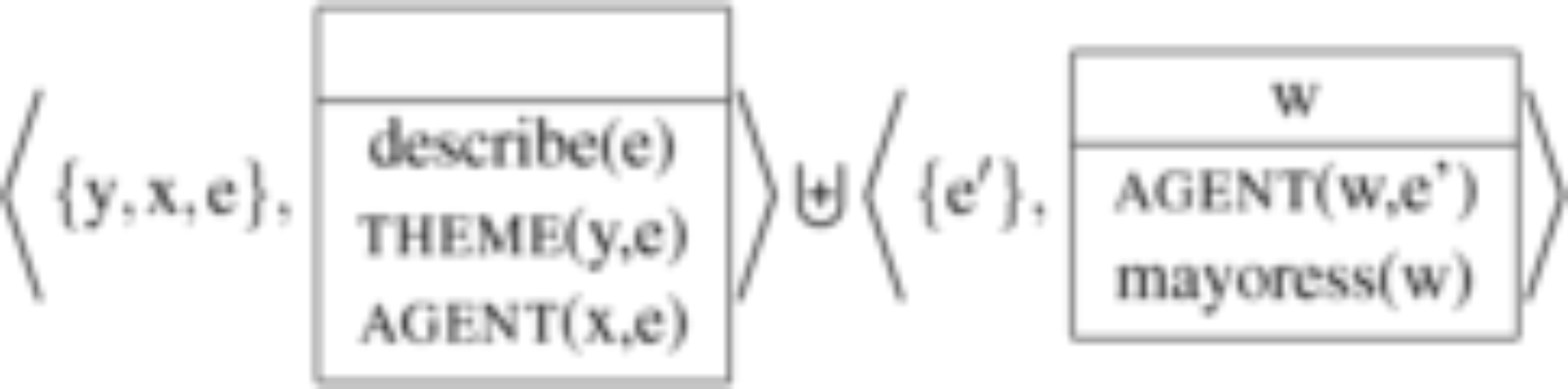

{v, e′},
AGENT(v,e’)

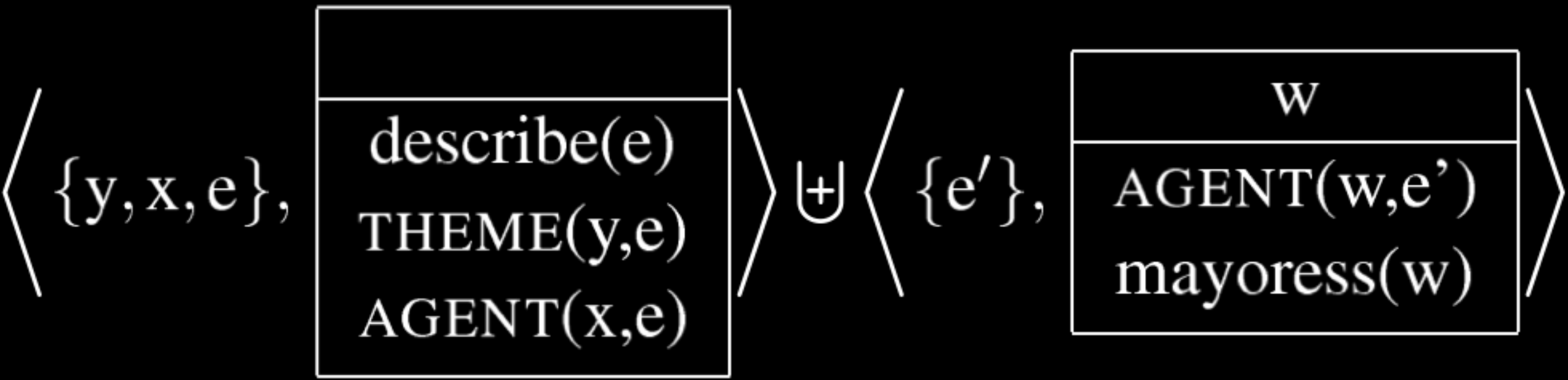

{e'},
w
AGENT(w,e')
mayoress(w)

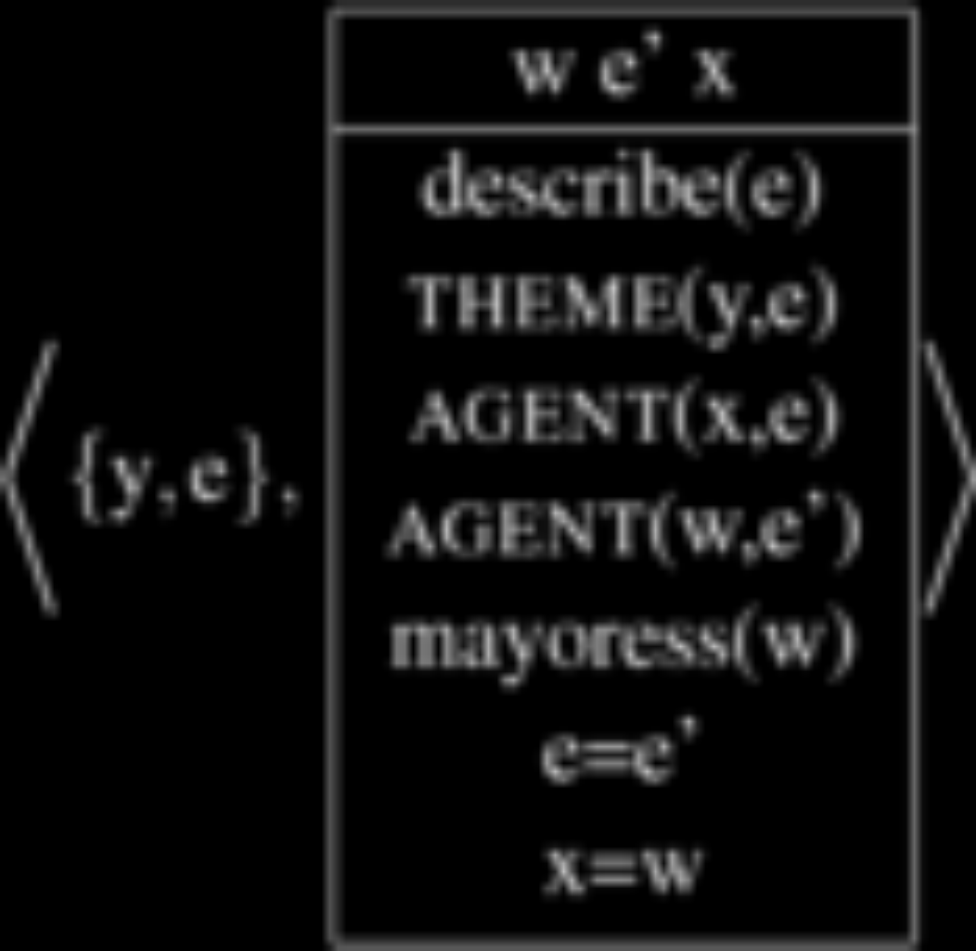

{e'},
w
AGENT(w,e')
mayoress(w)

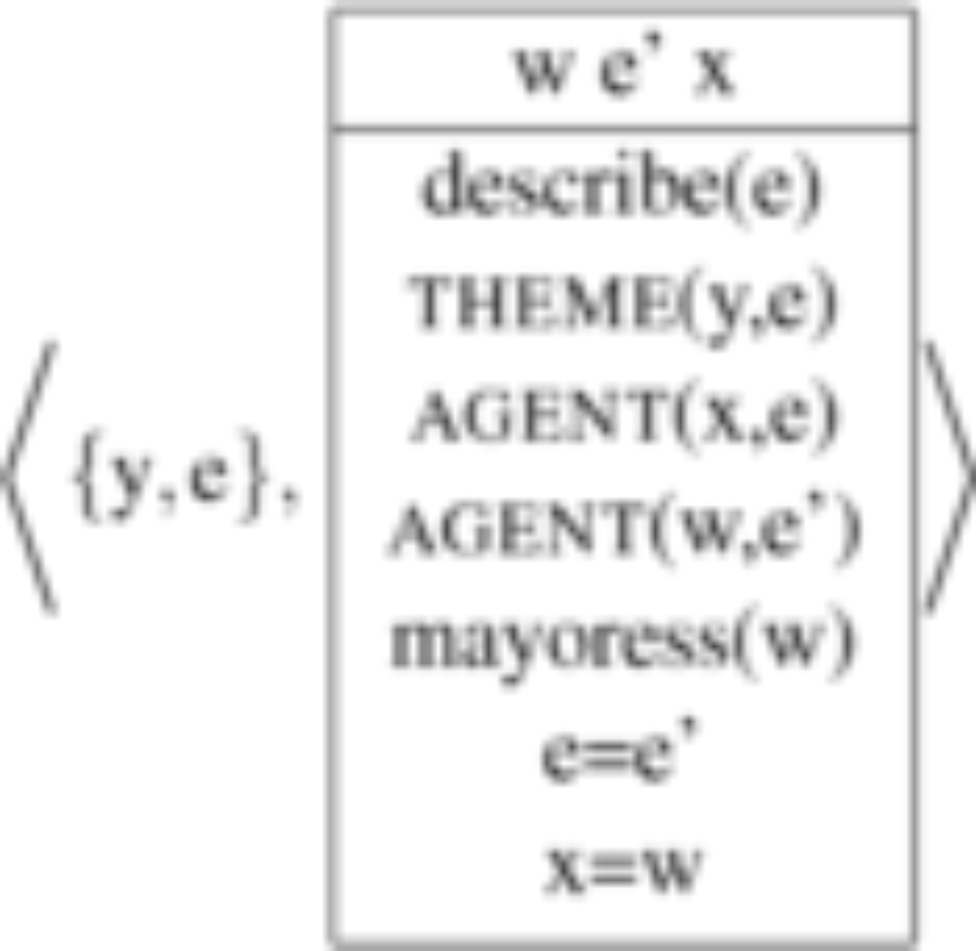

{e′},
w
AGENT(w,e’)
mayoress(w)

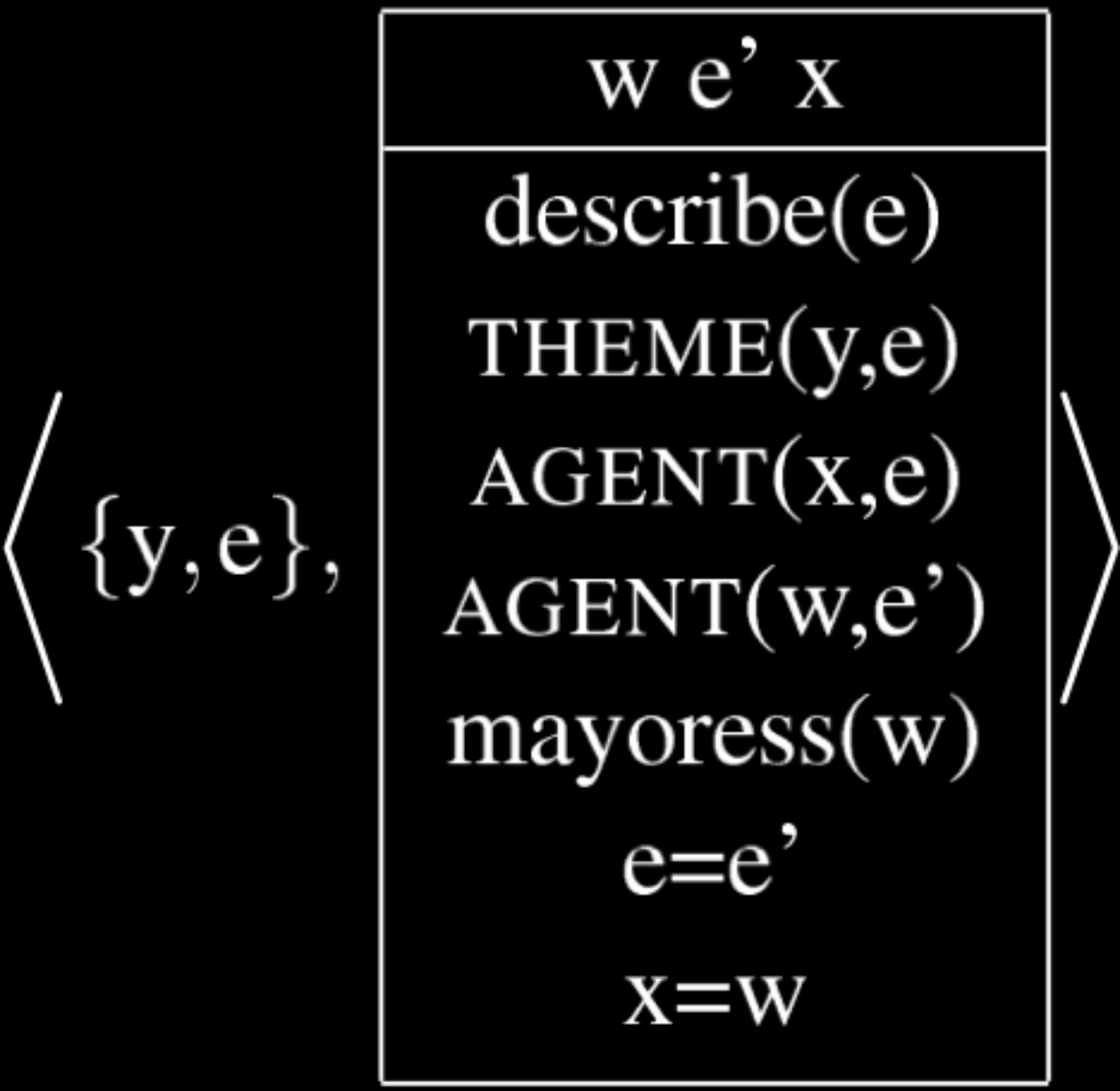

{y, x, e},
describe(e)
THEME(y,e)
AGENT(x,e)
⊎
{e'},
w
AGENT(w,e')
mayoress(w)


{y, x, e},
describe(e)
THEME(y,e)
AGENT(x,e)
{e'},
w
AGENT(w,e')
mayoress(w)


{y, x, e},
describe(e)
THEME(y,e)
AGENT(x,e)
⊎
{e′},
w
AGENT(w,e’)
mayoress(w)


w e' x
describe(e)
THEME(y,e)
AGENT(x,e)
AGENT(w,e')
mayoress(w)
e=e'
x=w
{y,e},


w e' x
describe(e)
THEME(y,e)
AGENT(x,e)
AGENT(w,e')
mayoress(w)
e=e'
x=w
{y,e},


{y, e},
w e' x
describe(e)
THEME(y,e)
AGENT(x,e)
AGENT(w,e')
mayoress(w)
e=e'
x=w

